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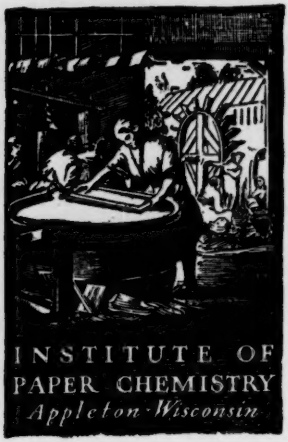
BULLETIN

OF

THE INSTITUTE OF PAPER CHEMISTRY



AFFILIATED WITH

LAWRENCE COLLEGE

APPLETON, WISCONSIN

LIBRARY NOTES

JUNE · 1949

Volume 19 Number 10

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Books and Pamphlets Added to the Library During May

ARCHITECTURAL ACOUSTICS

[LONDON, ALBERT] Sound insulation of wall and floor constructions. U. S. National Bureau of Standards. Building Materials and Structures. Supplement no. 2 to Report BMS17. Washington, U. S. Govt. Print. Off., 1947. 15 p.

CHEMISTRY, ANALYTIC—QUANTITATIVE

SIGGIA, SIDNEY. Quantitative organic analysis via functional groups. New York, Wiley, 1949. 152 p.

CHEMISTRY, ORGANIC

FORTSCHRITTE der Chemie organischer Naturstoffe. Progress in the chemistry of organic natural products. Herausgegeb. von L. Zechmeister. Wien, Springer-Verlag, 1948. 5. Band. 417 p.

COLLOIDS

ALEXANDER, A. E., and JOHNSON, P. Colloid science. Oxford, at the Clarendon Press, 1949. 2 v. 837 p.

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U. S. LIBRARY OF CONGRESS. *Copyright Office.* Copyright law of the United States of America. Bulletin no. 14. Washington, The Office, 1948. 40 p.

COTTON

DEAN, J. D. Preserving cotton fabrics in outdoor use. U. S. Dept. of Agriculture. Circular no. 790. Washington, U. S. Govt. Print. Off., 1948. 17 p.

EDUCATION, HIGHER

U. S. OFFICE OF EDUCATION. Education directory, 1948-49. Part 3. Higher education [prepared by Theresa B. Wilkins. Washington, U. S. Govt. Print. Off., 1948] 173 p.

ELECTRIC INSULATORS AND INSULATION

MALMLÖW, G. Thermal ageing properties of cellulose insulation materials. Kungl. Tekniska Högskolans Handlingar nr. 19. Stockholm, 1948. 67 p.

FIBERS

HARDY, THORA M. PLITT, and HARDY, JOHN I. Animal fibers used in brushes. U. S. Dept. of Agriculture. Circular no. 802. Washington [U. S. Govt. Print. Off.] 1949. 15 p.

PRESTON, J. M., ed. Fibre science. Foreword by F. Scholefield. Manchester, The Textile Institute, 1949. 341 p.

FORESTS AND FORESTRY

ILVESSALO, YRJO. The forests of present-day Finland, a description based on the national forest surveys. Communicationes Instituti Forestalis Fenniae. Helsinki, 1949. 56 p.

HORMONES (PLANTS)

MITCHELL, JOHN W., and MARTH, PAUL C. Growth regulators for garden, field, and orchard. Chicago, The University of Chicago Press [c1947] 129 p.

PAPER MAKING AND TRADE—HISTORY

BLUM, ANDRÉ. La route du papier. Grenoble, Éditions de l'industrie papetière, 1946. 83 p.

PAPER SPECIALTIES

ROCK RIVER PAPER COMPANY, *Chicago.* Patent building paper, its uses, advantages, cost, etc., manufactured by Rock River Paper Co., Chicago. Chicago, Press of Jameson & Morse, 1870. 38 p.

PHENANTHRENE

FIESER, LOUIS F., and FIESER, MARY. Natural products related to phenanthrene. 3d ed. of the monograph previously entitled "Chemistry of natural products related to phenanthrene," by L. F. Fieser. New York, Reinhold, 1949. 704 p.

PLASTIC MATERIALS

MODERN PLASTICS encyclopedia, 1949. New York, Plastics Catalogue Corp., c1949. 1371 p.

The main change in the revised 1949 edition is the inclusion of the previously separate charts in the text of the section "Technical data and charts." Only the "Plastics properties chart—1949" is still published in the old size, but folded and pasted inside the book. Articles containing new material will be abstracted in the section *Survey of Periodical Articles.*

SULFITE PROCESS

WURZ, OTTO. Die Sulfitzellstoffherstellung und ihre Nebenerzeugnisse. Graz-Wien, Leykam-Verlag [1948] 672 p.

WASTE PAPER

CLAPROTH, JUSTUS. Justus Claproth's Abhandlung von 1774 über die Verwendung von Makulatur zur Papierherstellung [Nachwort von Dr. Hans H. Bockwitz] Hagen-Kabel, Papierfabrik Kabel A-G, 1947. 35 p.

WOOD

STEER, HENRY B., comp. Lumber production in the United States 1799-1946. U. S. Dept. of Agriculture. Miscellaneous publication no. 669. Washington, U. S. Govt. Print. Off., 1948. 233 p.

Survey of Periodical Articles

The following are abstracts of opinions expressed by writers in the technical journals. The Institute of Paper Chemistry takes no responsibility for the opinions here summarized.

ADHESIVES

Cox, A. W. Adhesives in packaging. J. Inst. Packaging no. 2: 20-3 (Summer, 1948).

Following a brief history of the use of adhesives, beginning with the utilization of natural rosin for joining pottery and of a bituminous cement for Babylonian statuary some 6000 years ago, the author outlines the manufacture of hot and starch glues. Among the vegetable glues are gum acacia or gum arabic; water-insoluble resins; flour glues, one of the most important groups; dextrins, another prominent group; waste liquor from wood pulp; and rubber and latex. The chief mineral adhesive is sodium silicate, much used with corrugated paper for packaging. Others are zinc oxide, wax, and bitumen, which is extensively used for laminating paper and foil and is incorporated in many types of compounded adhesives. Classed as "abstract" adhesives are the synthetic resins, such as urea and phenol formaldehyde; cellulose nitrate and acetate; and synthetic rubbers. The particular type of adhesive to be used for a given job must be determined by mechanical strength (it must be at least as strong as the tensile strength of the weaker of two materials to be joined), resistance to degluing, price, speed of use, cleanliness, initial tack and setting time, and method of application. Adhesives may work by penetrating porous materials in and around the surfaced fibers and joints, by forming a firm, rather rapidly setting gel, and by partly dissolving the surface to be adhered. More cooperation between manufacturer and user would be to their mutual advantage. Most adhesives salesmen are prepared to give the user considerable technical assistance. R.R.

U. S. National Bureau of Standards. Techniques of adhesion. Packaging Parade 17, no. 196: 48, 50-1 (May, 1949).

Investigations of the adhesive properties of a wide variety of adhesives and adherends are reported and the testing conditions described. The results indicate that there are many variables involved in adhesion and that the breaking stress of a specimen is not always a measure of the adhesive-adherend bond strength. It may be a measure of the cohesive strength of the adhesive or the adherend. The electrical forces to which most present-day theories relate adhesion, and which may arise from hydroxyl, acetyl, nitrate, or other polar groups, tend to become of secondary importance in an actual bonded assembly where other variables are of prime importance. However, the electrical forces are probably the basic forces of adhesion and are always present. Therefore, a means must be found to modify the other variables so that the fullest use can be made of the basic attractive forces. A study is planned in which these variables will be separated and each one studied separately. R.R.

AERONAUTICS IN FORESTRY

STEVENS, D. R. Photographing cut-over areas. Pulp Paper Mag. Can. 50, no. 5: 146, 148, 150, 152 (April, 1949).

The procedures, advantages, equipment, and cost of aerial photography for mapping cut-over areas are outlined. E.S.

ALCOHOL

LASSENIUS, T. Statistics for the manufacture of sulfite alcohol. Finnish Paper Timber J. 31, no. 7 A: 4-8, 10 (Special issue, April, 1949). [In Swedish; English summary] *cf.* B.I.P.C. 19: 299.

The author reviews the development of the sulfite alcohol industry in different countries. Tabulated data are presented for the total production in Sweden (1909-1948), Finland (1920-1948), Norway (1938-1948), and Germany (1920-1944), and two diagrams show graphically the production of sulfite alcohol in these countries, as well as the yield of alcohol in kg./ton of sulfite pulp (based on the total amount of sulfite pulp produced in the respective country). A third diagram illustrates the years in which new alcohol plants were started in the three Scandinavian countries during the period from 1909-1948. A few data for other countries are given to the extent that the information was available to the author. 21 references. E.S.

ALKALINE PROCESSES

KURENNIEMI, TAUNO, and MURTO, JAAKKO O. The influence of elemental sulfur in alkaline cooks. Finnish Paper Timber J. 30, no. 24: 437-44 (Dec. 31, 1948). [In Finnish; English summary]

After briefly reviewing the pertinent literature, the results obtained in experimental sulfate cooks at the Central Laboratory in Helsingfors are outlined. These cooks, using pinewood and a sulfidity of 24-32%, were carried out with the addition of from 0-7.5% (of the wood weight) of elemental sulfur. The main effect of the sulfur addition was an increase in yield which amounted to 5-8.5% of the wood used or to 11-19% of the pulp yield obtained when the sulfate cook was carried out without the addition of sulfur. Best results were obtained within the range of 3-7% sulfur. The pulp yield was also found to increase when the cooking temperature was lowered. 4 tables, 2 diagrams, and 16 references. E.S.

ALKALINE PROCESSES—FURNACES

TAIT, W. The Wagner furnace. Proc. Tech. Sect., Paper Makers' Assoc. Gt. Brit. & Ireland 28, no. 2: 629-33; discussion: 633-8 (December, 1947).

The author describes one of the two Wagner furnaces at present in use in Scotland; it was installed at the Inverurie Mill in 1934 and designed for esparto liquors, with which it gives very satisfactory results, showing a steam recovery of 4000 pounds of steam per ton of grass. On straw, there is virtually no recovery of steam; moreover, on all-straw liquor, large quantities of fuel oil are required to maintain a suitable furnace temperature. The molten soda gives a clear solution when dissolved and, after the concentration in the dissolver tank has reached a certain predetermined percentage, the liquor is pumped away and causticized without further treatment. The intense heat in the bottom part requires relining with soapstone about every two years, whereas the top part requires it only every four or five years. The cost of relining is the big maintenance item, the cost of soap-

stone imported from Norway or Canada having gone up considerably during recent years. In the discussion, A. P. Taylor discussed the other unit installed at Guard Bridge, drawing particular attention to the various points of difference between the two furnaces. 2 diagrams. E.S.

BARKERS AND BARKING

ANON. Spring chemical treatment speeds fall barking of pulpwood. Western Pulp and Paper 2, no. 5: 10-11 (May, 1949); *cf.* B.I.P.C. 18: 817-18.

According to a Canadian patent obtained several years ago by A. R. White and improved by various organizations, certain chemicals, applied to the wood of living trees in the spring, are dissolved, absorbed, and carried with the sap; when the fall cutting season arrives, the cambium layer is still soft and the trees can be peeled as easily as in the spring. Arsenic trioxide and sodium arsenite are most effective. Some balsam fir and white spruce so treated in June could be peeled in September with bare hands. On other species it made fall bark removal as easy as sap-peeling. The treated pulpwood is also easier to handle in a barking drum. Other chemicals which can be used are ammonium sulfamate, sulfamic acid, and sodium chlorate (for conifers). The arsenic compounds also discourage insect and fungi attack. In practice, a strip of bark about 2½ inches wide is removed from around the base of the tree; the chemical, in paste form, is spread on a strip of crinkled kraft and fastened in place. The chemicals should cost less than a cent per tree. Two experienced workers could probably handle at least 500 trees per day. R.R.

BLEACHING—GROUNDWOOD

KINGSBURY, RALPH M., SIMMONDS, FOREST A., and LEWIS, EARL S. Bleaching groundwood pulps with hypochlorites. Pulp Paper Mag. Can. 50, no. 5: 98-102 (April, 1949); Tappi 32, no. 6: 273-6 (June, 1949).

Results of bleaching experiments made at the Forest Products Laboratory on groundwood pulps from 13 hardwoods, six softwoods, and a mixture of six hardwoods alone and in mixture with eastern white pine, show that calcium hypochlorite is a satisfactory bleaching agent for the hardwood pulps, but probably not for the softwood pulp. In general, the brightness of the hardwood pulps was increased to the range of 70 to 79% with 10% available chlorine. Upon exposure to carbon-arc light, the recession in brightness ranged from 4 to 11 points. Bleached pulp yields were 98 to 100% of the unbleached pulp. The only consistent effect of the bleaching on drainage and strength properties was an increase in tensile strength. In order to obtain a good bleaching effect with hypochlorite, its tendency to react very rapidly with groundwood pulp must be retarded considerably, especially at the start of the reaction. This was done by use of low density, low temperature, and a high alkalinity, the latter being the most critical of the three. The lime requirement for control of alkalinity ranged from 3 to 6%, including the free lime in the bleaching liquor. Substitution of sodium silicate for a part of the lime in the bleaching of some pulps further improved brightness up to five points. Final addition of sulfurous acid, or its equivalent, to the stock had a similar effect. Although the hue of hypochlorite-bleached pulps was in the yellow range in the case of hardwood pulps, it is believed to be light enough to be generally satisfactory. Experimental results indicated that pulps from mixtures of hardwoods can be bleached satisfactorily with hypochlorite and that the brightness of the mixtures will be proportioned to that obtainable on pulps from the individ-

ual woods. Although the eastern white pine pulp did not respond satisfactorily to hypochlorite, a 50-50 mixture of it and the mixed hardwood pulp was bleached to about 70% brightness with 10% available chlorine. Essentially the same result was obtained, however, by blending bleached mixed hardwood pulp with unbleached pine pulp. This procedure would be the more economical of the two. E.S.

BLEACHING—SULFATE

McCARTHY, JOSEPH L., and HIBBERT, HAROLD. Multistage bleaching of kraft pulp. Pulp Paper Mag. Can. 50, no. 5: 88-93 (April, 1949); *cf.* B.I.P.C. 12: 109-10.

The multistage bleaching of kraft pulp with aqueous solutions of chlorine has been studied, particularly the effects of temperature and pH of the second stage of bleaching and the effect of distribution of chlorine between stages. Under comparable conditions, it was found that, when increasing proportions of chlorine are permitted to react in the second stage, the chemical and physical characteristics of the cellulose deteriorate, although the degree of whiteness is improved. A temperature increase in the second-stage reaction mixture results in an improved rate of reaction and whiteness of the cellulose with simultaneous greater degradation of the product. When the alkalinity of the second-stage reaction mixture is raised from pH 6 to 9.5, an improvement in the quality and whiteness of the cellulose is obtained, although the rate of reaction is diminished. The present investigation has been carried out to correlate certain bleaching results, which may be achieved in the multistage versus single-stage processing of kraft pulp, and to point out certain trends of interest; no attempt is made to give directions for the industrial bleaching of any particular pulp. 11 references. E.S.

BOARD MILLS

ANON. Fairfield starts new board mill in Ohio. Paper Ind. 31, no. 2: 196-201 (May, 1949).

An illustrated description of the new board-manufacturing unit of the Fairfield Paper and Container Co., Baltimore, Ohio, is given. The new mill is housed in a two-story L-shaped structure built against the old No. 2 machine room and box plant. It houses a complete stock preparation system (two Hydrapulpers, a Hydrafiner, and five jordans, together with cleaning equipment, thickeners, and agitators) and a new Black-Clawson cylinder machine with five molds, Hydronamic inlets, and 66 48-inch seamless driers and one 24-inch pony drier. The drier section is covered by a Ross hood equipped with a standard exhaust system. The steam plant is being modernized and expanded with the installation of a new Babcock & Wilcox Stirling two-drum boiler unit. Until this construction is completed, the capacity of the new board machine is restricted. The new mill is designed to turn out over 150 tons of cylinder test liner or chipboard per day; the raw material consists mainly of various grades of waste, including corrugated and mixed kraft wastes. Unbleached kraft pulp is used in some grades. E.S.

ANON. Gypsum board—a modern building material. Finnish Paper Timber J. 31, no. 7 A: 48-51 (Special issue, April, 1949). [In English]

An illustrated description is given of the new gypsum board mill at Myllykoski, Finland, with a daily capacity of 65 tons. The boards (Gipsonit) consist of an internal layer of pure gypsum and outside covers of millboard

of exceptional strength. The properties and applications of Gipsonit are briefly outlined. E.S.

McGINN, E. P. Macon Kraft mill now in full production. Paper Trade J. 128, no. 20: 21-2, 24, 26, 28, 30, 32, 34, 36, 38, 40-3; no. 21: 22 (May 19, 26, 1949); Paper Mill News 72, no. 22: 14-16, 18, 22, 24-6, 28, 30 (May 28, 1949).

A detailed illustrated description is given of the mill recently put into operation by the Macon Kraft Co., Macon, Ga., a subsidiary of the Mead Corp. and the Inland Container Corp., which uses much of the new mill's output in the manufacture of corrugated fiber shipping containers. The entire process and all equipment are carefully considered. The chips are cooked in six digesters, each with a volume of 4300 cu. ft. and a capacity of about 12 tons of pulp for each 2¾-hour cooking cycle, with 9000-10,000 gallons of white liquor and 4000-5000 gallons of black liquor at a maximum of 343° F. and 110 p.s.i.; sulfidity is maintained at about 23%. Equipment for the Hercules automatic emulsifying process consists of three proportioning pumps driven by a single motor, an injector, turbine mixer, emulsion tank, thick size storage tank, and hot and cold water tanks; a flow sheet of the system is included. The Buccaneer, a 540-foot Beloit Fourdrinier, is the longest paper machine in operation. On 42-pound liner, the present operating speed is 1380 ft./min. The average daily production is 575 tons; the highest attained has been 650 tons. The Shartle-Miami broke beater is one of the largest ever built. The unusual conveyor system, supplied by Jervis B. Webb Co., for handling shipping rolls, is set flush with the floor and is controlled by one operator, who also weighs and stencils each roll while it is on the conveyor. The extensive ventilating and heating systems were installed by the J. O. Ross Engineering Co. and include the largest on any single paper machine. The recovery system includes two Combustion Engineering recovery furnaces, two Cottrell precipitators, and Cascade evaporators. The causticizing process, lime kilns, and salt-cake handling are also described. In the second part of the first reference given above is a list of equipment and suppliers. Officers of the company and the chief personnel are included in the second reference which, although it is not a duplicate of the first, gives essentially the same information. R.R.

BOARD SPECIALTIES

ANON. Novel houses built of newsprint cores. Western Pulp and Paper 2, no. 5: 15 (May, 1949).

Illustrated descriptions are given of Texas houses built of newsprint cores. For one structure, the cores were treated with linseed oil and several coats of paint. The finished cores look much like logs. R.R.

ANON. Sonoco Products Company marks half century of development. Rayon and Synthetic Textiles 30, no. 5: 57-9 (May, 1949).

Reference is made to the main plant of Sonoco Products Co. at Hartsville, S.C., where a better and less expensive product was developed on which to wind textile yarns—a paper cone in the place of the old wooden cone. When the first chemical fibers were developed, the paper cones used for cotton and woolen yarns were not suitable, because they had a tendency to split the fiber, especially in the magazine creeling operation. If the cones were made sufficiently smooth so that the filaments would not be damaged, the yarn would not stay on it. Experiments with different cone tapers led

to the final adoption of a taper of 3° 30′ for synthetic yarns and to the development of special noses and lacquers for the cone tips, which had to be resistant to all chemicals encountered in the finishing operations. The lacquer is now prepared by Sonoco not only for its own use but also for its many customers for finishing synthetic carriers. The results of these studies are the "Velvet Surface cones" further modified by bands to prevent slippage and the "Unitex Surface cones," flocked cones provided with additional holding surfaces. No details of materials or processes going into the manufacture of these cones are given. In conclusion, the excellent labor relations of the company are stressed. E.S.

BOARD TESTING—PHYSICAL

SKARK, LEOPOLD. Moistening and elongation of flat fibrous structures, especially fiberboards. Das Papier 3, no. 5/6: 82-5 (March, 1949). [In German]

The author studied the difference between stretched and unstretched fiberboard samples with regard to their tensile strength, resistance to fracture, Brinell hardness, swelling capacity, and water sorption at varying moisture contents. In one series in which the moisture content was increased from an initial 0.6% to a final 4.0%, the stretched board was stronger than the unstretched sample. The increased moisture content had actually contributed to an increase in tensile strength and resistance to fracture of the stretched material. When the moisture content was raised (from 0.7%) to 9%, the stretched sample at the higher water content still showed somewhat better strength properties than did the unstretched sample, but the over-all strength properties were inferior (in either case) to those of the boards with the lower (initial) moisture content. The author explains this on the basis of a loosening of the fiber structure with excessive moistening. L.E.W.

CELLOPHANE

ANON. 25 years of cellophane. Dupont Mag. 43, no. 3: 8-10 (May-June, 1949).

Cellophane entered the packaging field in the early 1920's, the present year marking the 25th anniversary of its initial manufacture in America. In 1927, a moisture-proof cellophane was announced, which was quickly accepted as a wrap by the cigar industry and then by others. There are now over 50 kinds of cellophane, each with different characteristics. Manufacturing economies resulted in 21 price reductions before the last war. R.R.

CELLULOSE

BORGIN, KARL. The solubility of cellulose in strong electrolytes, particularly sodium zincate. Norsk Skogind. 3, no. 4: 96-103 (April, 1949). [In Norwegian; English summary]

A brief survey of the present theories on the solubility of cellulose is given. Cellulose swells in a number of solutions of salts, acids, and bases. This swelling, in many cases, may lead to eventual solution, when the correct concentrations and temperatures are employed. When cellulose swells or dissolves, it is usually claimed that the cellulose combines in some way with the swelling agent or solvent. However, the exact type of compound formed is hardly ever indicated and, with a few exceptions, no valid proof is given for the actual existence of such compounds. X-ray analysis has shown in a few cases that a new compound has been formed which gives a fiber diagram distinctly different from the diffraction pattern of cellulose. Almost nothing is known regarding the type of compound formed,

the chemical bonds involved, and the nature of the reaction. The theories are many and varied concerning the nature of the forces by which molecules are held in solution by cellulose. There is a strong correlation between the solubility of cellulose and the formation of a compound. It is not the cellulose itself which is soluble, but the compound formed between cellulose and solvent. The problem might possibly be clarified if the exchange reaction between cellulose and solvent were studied. In order to accomplish this goal, the author used radioactive isotopes and followed the exchange process with the ordinary tracer technique. The rate and completeness of the exchange reaction could be studied easily and gave valuable information regarding the bonds between cellulose and solvent. In one case it could not be concluded from the experiments that the compound was of a homopolar type, or that an ionic compound was formed, but it was shown that the molecules were held by hydrogen bonds or dipole-dipole forces. The results will be published in detail in another place. E.S.

PACSU, E. Recent developments in the structural problem of cellulose. Fortschritte der Chemie organischer Naturstoffe 5: 128-74 (1948). [In English]

The author reviews the subject with particular reference to the linear and laminated chain structure of cellulose. 101 references. E.S.

SVEDBERG, THE. The structure and polymolecularity of cellulose. Svensk Papperstidn. 52, no. 7: 157-64 (April 15, 1949). [In Swedish; German and English summaries] *cf.* B.I.P.C. 13: 273.

Continuing his previous discussion, the author reviews physico-chemical researches on cellulose carried out since 1942 at the Institute of Physical Chemistry at Uppsala. In these studies the previously described ultracentrifugal and diffusion methods found application and are now supplemented by electron microscopy and osmotic-balance measurements. The construction and use of the osmotic balance are described. Information on the frequency curves of cellulose was obtained by a combination of fractional precipitation, ultracentrifugal sedimentation, and osmotic measure of the nitrates. The fractions are summarized as triangles, their widths having been determined by ultracentrifugal measurements. The resulting frequency curves are rather complicated functions, exhibiting in general several maxima. Native and depolymerized celluloses (sulfite and sulfate pulps, rayon, etc.) have a common maximum for the D.P. range of 70-100. After strong degradation, most of the cellulose accumulates at the maxima of the D.P.'s of 100 and 200. Of these two, only the first maximum is left after boiling in 2.5 *N* sulfuric acid. This tendency is probably caused by structural regularities of the cellulose wall. Earlier investigations have shown that cellulose is fibrillar and partly crystalline. Degradation experiments (partial hydrolysis, ultrasonic waves) resulted in aqueous colloidal solutions of cellulose. Electron-microscopical and electron and x-ray diffraction studies on these solutions revealed that the cellulose particles are rod-like and have fairly uniform dimensions (length $\sim$ 500 A., width 50-100 A.). They give sharp electron diffraction patterns, indicating good crystallization. Their length corresponds to that of the cellulose molecules in the first maximum of the frequency curves. It is probable that the isolated particles are the crystalline parts (crystallites) of the cellulose fibrils which, according to earlier x-ray investigations, were considered the micelles in the fibers. The micelles isolated by hydrolysis represent no new crystalline phase, as they give the same Debye-Scherrer diffraction lines as the native cellulose. Their diffraction pattern is sharper and of higher intensity, indicating that

the amorphous phase of the cellulose was removed through hydrolysis. 28 figures and 17 references. E.S.

CELLULOSE ESTERS

MALM, C. J., NELSON, H. B., and HIATT, G. D. Cellulose acetate butyrate strip coating compositions. Ind. Eng. Chem. 41, no. 5: 1065-9 (May, 1949).

In recent years wide use has been made of melt dipping as a method of applying plastic coatings to protect articles from corrosion and abrasion. Thermoplastic polymers compounded with plasticizers, resins, waxes, and oils have been used. In the present work a commercial high butyryl cellulose acetate butyrate is tested with several plasticizing agents, and the physical properties of these compositions are measured. A level of 50% cellulose ester is generally used, although for certain applications 35% ester is sufficient. Some plasticizers tend to give low tensile strength but balance this shortcoming by good low-temperature flexibility. Resin additions tend to reverse this behavior. Blends are made in an effort to balance desirable properties. Several compositions are described and rated according to their over-all properties. No one composition is useful for all applications. Thought must be given to the proper balancing of ester, resin, plasticizer, and oil to secure the desired composition. The importance of ester viscosity in influencing physical properties is brought out by a comparison of compositions based on cellulose acetate butyrates of low and medium viscosity. E.S.

CELLULOSE ETHERS

SÖNNERSKOG, SVEN. Some views on the gelation of aqueous solutions of ethyl cellulose on heating. Acta Chem. Scand. 2, no. 5-6: 523-6 (1948). [In English]

Ethyl ethers of cellulose, showing a degree of substitution between 1.2 to 1.4, dissolve in cold water to a clear viscous solution. On cooling, a sudden increase in viscosity is observed as soon as the main portion of the ether has dissolved. The phenomenon is explained by an analysis of the possibilities of cross linking, as well as by simple orientation of the water dipoles with regard to the hydroxyls of the cellulose chains. The gelation on heating is shown to be essentially caused by the removal of purely oriented water molecules. E.S.

CHEMICAL TESTING—CELLULOSE—FRACTIONATION

SCHERER, PHILIP C., and PHILLIPS, ROBERT W. Fractionation of a cellulose xanthate derivative. Rayon and Synthetic Textiles 30, no. 5: 45-6, 53-4 (May, 1949).

When cellulose xanthate is prepared by the usual steeping of cellulose in 18% sodium hydroxide, followed by treatment with carbon disulfide, approximately one hydroxyl group per two glucose residues of the cellulose molecule is converted to a xanthate group. The present research was carried out to determine the actual distribution of the degrees of substitution of cellulose xanthate fractions with various D.P.'s. The xanthate was prepared in the normal manner and, being itself very unstable, was converted into the diethylacetamide derivative. After considerable investigation, a suitable solvent was found for the derivative in an aqueous chlorhydrin solution. From a solution of the derivative in this solvent, fractional precipitation was carried out by the addition of excess amounts of water.

The fractions were recovered, analyzed for nitrogen content, and the D.P. of each was determined by the Staudinger viscosity method. The results are presented in two tables and three diagrams. Although the data obtained are not as satisfactory as was hoped for, they indicate a wide distribution of differently substituted materials in cellulose xanthate, which is, therefore, not composed of uniformly substituted chains. The rather wide spread in the D.P. values of the xanthate is not surprising, since the original cellulose used shows this polymolecularity. When cellulose is converted into a xanthate, the xanthate groups may enter the structure either rapidly or very gradually. If the penetration by the reacting carbon disulfide is very rapid, the conversion of the hydroxyl groups to the xanthate should take place uniformly throughout all chains and, as a result, these chains should possess the same degree of substitution on the average. If, on the other hand, rapid penetration is inhibited for some reason, the hydroxyl groups of chains lying close to the surface of the macroscopic fiber or on the surfaces of the microfibrils will have most of their hydroxyl groups converted to xanthate before those lying inside the structures can be changed. The results reported in the present study reflect the second type of reaction; the heterogeneity of the cellulose xanthate as to degree of substitution is assumed to be the result of the slow penetration of the carbon disulfide into the soda cellulose structure. This appears to be in agreement with known types of topochemical reactions. The slowness of penetration may be explained by the relative insolubility of carbon disulfide in sodium hydroxide solution. E.S.

CHEMICAL TESTING—PULP—ACCESSIBILITY

TIMELL, TORE. Investigations on cellulose reactions. VII. The periodate method for estimating the amount of easily accessible material in cellulose. Svensk Papperstidn. 52, no. 5: 107-12 (March 15, 1949). [In English; German and Swedish summaries] *cf.* B.I.P.C. 19: 616.

The various physical and chemical experimental methods which have been used to calculate the proportion of amorphous or easily accessible material in cellulose (as distinguished from the crystalline portions) are reviewed briefly. The periodate method introduced by Mark and his associates (*cf.* B.I.P.C. 14: 75) was selected by the author for further investigation, and applied to several celluloses, methylcelluloses, and hydrocelluloses. The values obtained are compared with those found by other methods. The agreement among the chemical methods involving hydrolysis or oxidation is good. But, as previously found, the physical methods (such as density measurements or replacement by heavy hydrogen) show a much higher proportion of easily accessible cellulose in all cases. However, it is concluded that, for a practical comparison of different celluloses, the periodate method is convenient, precise, and involves very mild reaction conditions. By methylation of sodium cupricellulose and subsequent periodate oxidation, it is shown that, in the formation of cellulose ethers, the amorphous portion reacts first and at a more rapid rate. 27 references. M.A.H.

CHEMICAL TESTING—PULP—PENTOSANS

TEUNISSEN, PIETER HENDRIK. Determination of pentosans in cellulose; simplification of TAPPI Standard T 450 m 44 method. Anal. Chem. 21, no. 5: 620-2 (May, 1949).

A determination of pentosans by an abbreviated form of TAPPI Standard T 450 m-44 method is discussed. The method is shortened by not adding

fresh hydrochloric acid during distillation. A change in the calculation formula is required. A correction factor for the presence of hydroxymethylfurfural is presented. E.S.

CHEMICAL TESTING—WHITE LIQUOR

CENTRAL LABORATORY OF THE CELLULOSE INDUSTRY. *Analysis Committee.* Analysis of white liquor. Svensk Papperstidn. 52, no. 7: 168-73 (April 15, 1949). [In Swedish, German, and English] *cf.* B.I.P.C. 17: 719.

The text of the Swedish Standard CCA18 is given, covering methods for determining sodium hydroxide, sodium sulfide, and sodium carbonate; sodium sulfate and reduction; total sulfur; and sodium chloride in white liquor. E.S.

COLORIMETRY

THOMPSON, JOHN P., and POLLNER, LOUIS. Color matching devices. Fibre Containers 34, no. 4: 46, 48, 51 (April, 1949).

The article is based on a discussion of two color matching devices presented before the Chicago Section of TAPPI in February, 1949. John P. Thompson described the General Recording Photoelectric Spectrophotometer of the General Electric Co. and Louis Pollner discussed the Hunter Color and Color-Difference Meter, manufactured by the Henry A. Gardner Laboratory, Inc. E.S.

CONTAINER INDUSTRY

ANON. Toy packages. Modern Packaging 22, no. 9: 92-6, 178, 180 (May, 1949).

Toy packaging has become a close second in importance to the product itself. Consumers are attracted by containers that can be used as toys or that encourage children to put toys away when playtime is over. The success of branded toy lines and the popularity of containers which need no further packaging in the store are other reasons for toy packaging. Visibility and better display features are receiving more attention than formerly. Good packages are described and illustrated. R.R.

MOORE, W. CLEMENT. Now it's up to management . . . Shears 67, no. 677, special supplement: 2 pages (May, 1949).

In an address given at the annual meeting of the National Paper Box Manufacturers Association in May, the author blamed the industry's uneasiness for the 5.39% decline in sales in 1948. The average profits in the country declined 18.88%. The average plant kept material cost and factory overhead fairly well in line with sales decreases, but did not control labor, delivery, sales, and administrative expenses so well. The average of replies from paper box manufacturers regarding prospects for 1949 forecasts a decrease of about 12.2% from 1948 business. R.R.

CONTAINER INDUSTRY—EDUCATION

ROGERS, ALAN. Who shall design the pack? J. Inst. Packaging no. 3: 14-18 (Autumn, 1948).

Much of the responsibility for bad packaging is attributed to package suppliers and less reputable agencies and studios. The author suggests that the Society of Industrial Artists be consulted on questions of the educa-

tion and status of the package designer, since only when there is some recognized professional standard in the packaging field will manufacturers be sure of the quality of their packages. The would-be package designer should study surface design and problems of typography, lettering, illustration, and color in relation to packaging and have some knowledge of advertising. A discussion is given of what art schools should do for the student of commercial art. The creation of an effective package depends upon an integrating factor, which should be the package designer. He should be present at conferences from the time that a new package design is first considered and hear the various opinions expressed by sales and advertising managers and production executives. R.R.

CONTRACT PACKAGING

LEEDS, CARL M. Contract packaging. Soap Sanit. Chemicals 25, no. 5: 37-8 (May, 1949); *cf.* B.I.P.C. 19: 542.

Similar information about contract packaging is given as in the previous article; the advantages of the contract packager to large and small organizations are outlined. E.S.

CORES

REYNOLDS METALS COMPANY. *Industrial Machinery Division, Louisville, Ky.* Paper core made of special aluminum. Paper Ind. 31, no. 2: 262 (May, 1949).

Brief reference is made to a rigid aluminum core stock developed from a tough heat-treated alloy especially designed for the paper industry. Paper cores made from this material are so light that one man can handle several easily. They are sufficiently strong to prevent crushing or collapsing when supporting heavy rolls of paper and have the added advantage that they do not rust and stain the paper. E.S.

COTTON

HAMALAINEN, CARL, and REID, J. DAVID. Partial acetylation of cotton cellulose by ketene. Ind. Eng. Chem. 41, no. 5: 1018-21 (May, 1949).

Linters and cotton sewing thread have been acetylated with ketene. The treatment involves preswelling with water, removal of the excess water by extraction, suspension of the cotton in an inert solvent (preferably ether) containing a catalyst (preferably perchloric acid), and treatment with ketene as prepared by the pyrolysis of acetone. Samples containing up to 17% acetyl retained their fibrous structure with only slight degradation. The ketene acetylation was accompanied by an objectionable polymerization of ketene which produced a yellow to dark brown coloration of the sample. The color could be removed by hot alcohol. Although the emphasis was on the reaction of water-activated, solvent-dehydrated cellulose with ketene, some experiments were tried in which the cotton was swollen with acetic acid before the introduction of ketene. Acetylation was probably caused by the acetic anhydride formed. 13 references. E.S.

DISINFECTION AND DISINFECTANTS

SHEMA, B. F. Preservation of groundwood pulp during storage. Tappi 32, no. 5: 227-8 (May, 1949).

The results of a mill trial in which two disinfectants, Santobrite and Lignasan, were used in an attempt to prevent degradation of groundwood

caused by micro-organisms are presented. The agents at various concentrations were applied to the pulp on a lap machine. The stock was then stored and examined periodically. It appears from this particular trial that no less than 0.14% (by weight) Santobrite must be retained by the pulp for effective results. The data for Lignasan were inconclusive because of an error. E.S.

ENGINEERING

MOON, D. G. The engineer in the pulp and paper mills. Southern Pulp Paper Manuf. 12, no. 5: 68-71 (May, 1949).

The author reviews briefly the growth of the industry in the United States with the gradual inroad of technical developments and the slow transition of old-time pulp and papermaking to the trained technical operator of today. He discusses the need of the industry for chemical, consulting and designing, sales, plant, civil, mechanical, forest, electrical, and sanitation engineers, and the opportunities offered to them through further mechanization and development of new processes. E.S.

ENZYMES

HASSID, W. Z., and DOUDOROFF, M. Enzymatically synthesized polysaccharides and disaccharides. Fortschritte der Chemie organischer Naturstoffe 5: 101-27 (1948). [In English]

The review covers chiefly recent developments and is limited to those carbohydrates of which the mechanism of formation is known or partially known. 79 references. E.S.

FINISHING ROOM

MCNEILL, D. Cutting. Proc. Tech. Sect., Paper Makers' Assoc. Gt. Brit. & Ireland 28, no. 2: 509-12 (December, 1947).

With reference to the fact that one of the biggest problems in the fine paper industry today is to find skilled labor for the finishing room, particularly trained sorters, the author suggests a semiautomatic combination of reeler (into the exact width required), cutter, sorter, counter, and delivery to the packaging table, supervised by one sorter-operator. The sheets after cutting pass over traveling tapes which run over a table about two yards long, at which table the sorter-operator is sitting in a comfortable chair, each hand controlling four push buttons. The left hand controls inch, speed-up, retard, and stop, and the right hand seconds, broke, perfect ream, and seconds ream. At top speed, a skilled woman operator could easily sort about 75-80 reams per day, the present average being 25 reams. E.S.

FOAM

ROSS, SYDNEY. Chemical antifoaming agents. Chem. Inds. 64, no. 5: 757-9 (May, 1949).

Various available antifoaming agents are so effective that only a trace quantity may be required; they are capable of a wide and useful range of application and spread on either aqueous or oily surfaces. Following a discussion of the theory of foam inhibition, consideration is given to the chemical types of inhibitors. One of the earliest used is octyl alcohol, which is now meeting with competition from di-isobutyl carbinol; in some applications they are best used together. The higher polymerized glycols are useful in preventing the foaming of boiler waters in steam generation. Among the fatty acids and fatty acid esters, Nopco Vegifat Y, primarily long and

short chain fatty acids, has been found useful in fermentation and yeast production. Many of the fatty acid esters are nontoxic and therefore useful in food manufacture. Of the glyceride esters, Nopco KF, a mixture of wax and partial glycerides, is used during various stages of pulp and paper making. Nopco 1907 is successful in controlling foam on animal glues. The fatty acid esters of glycols and polymerized glycols are utilized as antifoaming agents for glue solutions, paper-pulp suspensions, fermentation masses, and starch pastes. Fatty acid amides are used with boiler water, paper stock, glue, starch, and casein solutions. The 1,3-glycols and their hydroxyalkyl ethers are also successful foam inhibitors. Many organic phosphates, such as trioctyl phosphate, have been recommended as antifoaming agents. Victawet 35B and Victawet 12 combine efficient wetting with freedom from foaming tendencies. The defoaming action of metallic soaps of fatty acids may be caused by the free fatty acid resulting from hydrolysis rather than by the metallic soap. Perhaps the most versatile of all antifoaming agents are the recently developed silicones, known as DC Antifoam A and Anti-Foam 81066. The former is effective in both aqueous and nonaqueous systems, often in very low concentrations. Silicone antifoaming agents provide a rather high interfacial tension against water, which gives a large spreading coefficient, but unfortunately also hampers the ease of dispersion of the silicon fluid so that the antifoam droplets do not readily reach the film between the bubbles. Additional trade names, sources of these agents, and their applications are given. R.R.

FOLDING BOXES

FOLDING PAPER BOX ASSOCIATION OF AMERICA. Consumer acceptance tests reveal demand for packaged lemons. Shears 67, no. 677: 23 (May, 1949).

In consumer-acceptance tests, packaged lemons accounted for 550 out of 688 sales when there was no price differential; when offered at 2-4 cents less per half dozen than the packaged fruit, the bulk sold much faster. The package need not be of a type to permit the "breathing" of its contents, should be easily filled, and include a large cutout for maximum visibility; a film window is unnecessary if the package is so constructed that the lemons will not otherwise fall out. The color should contrast pleasantly with that of the fruit. The thickness of the board used for cartons depends on the number of lemons packaged. The chief reason for packaging the fruit lies in the greater convenience of the consumer unit. R.R.

WILSON, ALICE M. Package development. Food Industries 21, no. 5: 609-15 (May, 1949).

The author traces the steps in the development of nine successful food packages in the hope that the information will be of use to others with similar packaging problems. The packages discussed are a coconut carton, two cereal boxes, a cracker container, a boat with a transparent overwrap for cookies, a candy wrap, a double-tube package for chocolate wafers, a cylinder for ice cream, and a stand-up window box for macaroni. A packaging check list is included to serve as a guide for good consumer packaging, and the procedure followed by General Foods for developing new or improving old packages is outlined. R.R.

FORESTS AND FORESTRY

BONNER, EDWARD. The silvicultural research program of the Spruce Falls Power & Paper Company Limited. Pulp Paper Mag. Can. 50, no. 5: 131-2, 134-5 (April, 1949).

A brief outline of the silvicultural problems in the clay belt of Ontario in the James Bay drainage area is given, with particular reference to the results of regeneration surveys. The outstanding problem of the region is to obtain natural regeneration of spruce on the well-drained slopes. Although natural reproduction of spruce may be improved by alternating logging techniques, no method has been found to assure adequate amounts of it. Artificial regeneration will be necessary on a portion of this site. E.S.

GEVORKIANTZ, S. R., KILP, F. G., DOSEN, R. C., and SCHMIDT, O. A. A method of evaluating land for pulpwood production. J. Forestry 46, no. 9: 674-8 (September, 1948).

Individuals and many wood processing companies are now engaged in building up forest properties. Few start it with basic assurance as to what they can afford to pay for a specific forest tract. The authors show how a true evaluation of the costs involved enables them to determine how much the company can afford to pay for a given tract of land. The principles outlined are widely applicable. E.S.

GILLETT, CHARLES A. Trees for America—industry's solution of wood supply. Pulp Paper Mag. Can. 50, no. 5: 124, 126, 128, 130 (April, 1949); *cf.* B.I.P.C. 19: 546-7.

A description of the "Keep America Green" and the "American Tree Farm" programs is given, similar to that of the previous reference. In addition, the latest project, "More Trees," is discussed, with particular reference to the state of Alabama, where this program, also called "Cash Crops" program, has been underway for the longest time, starting on January 1, 1948. E.S.

MCLINTOCK, THOMAS F. Cost of timber marking in pulpwood stands. J. Forestry 46, no. 10: 763-4 (October, 1948).

Marking timber before cutting is essential for the elimination of low quality and defective trees below the set diameter limit and for the preservation of any vigorous fast-growing trees in excess of the diameter limit which should be left. Eight experimental cuttings made by the staff of the Northeastern Forest Experiment Station during the past three years are used as a basis for estimating a cost of about 20 cents per cord for the labor involved in marking—based on a wage of $10 per day—and less than 2 cents per cord for the paint and kerosene used. A crew of five, consisting of one tally man and four markers, provided the smoothest working unit, although in commercial operations it might be possible to eliminate the tally man, reducing labor costs to about 15 cents per cord. R.R.

WATTS, LYLE F. A forest reappraisal. Sci. Monthly 68, no. 6: 408-14 (June, 1949).

The findings of the forest reappraisal are discussed, which have recently been published by the U. S. Forest Service under the title "Forests and national prosperity" (*cf.* B.I.P.C. 19: 607). E.S.

FORESTS AND FORESTRY—EDUCATION

DYER, D. Foreman training for the logging camps of the Spruce Falls Power & Paper Company, Limited. Pulp Paper Mag. Can. 50, no. 5: 154, 156 (April, 1949).

The author describes the details of the contracted four-month course in foreman training given to a selected number of forestry undergraduates in 1947 and 1948 to restore the war-depleted camp foreman staff of the company and to meet the demands for a period of expansion. These courses were not inexpensive, yet they are felt to be a good investment. E.S.

FURFURAL

SHIVER, H. E. Pentosan concentrate from cottonseed hulls. Ind. Eng. Chem. 41, no. 5: 978-82 (May, 1949).

Owing to the rapidly increasing industrial importance of furan chemistry, a study has been made of the possibility of enhancing the value of the cottonseed hull as a raw material for the manufacture of furfural. To the initial advantage of the highest pentosan content of any known plant material must be added the fact that the unique structure of the hull permits concentration of the pentosan content by the simple inexpensive expedient of milling and screening. By properly regulated forces of disintegration and by fractionation at the proper screening level, the raw material may be separated into two substantially lint-free fractions of approximately equal bulk; the coarser fraction is more than 50% richer in pentosan than the original material, and the finer is significantly improved in fat and protein content. Thus, more than 80% of the pentosan is separated and recovered in little more than 50% of the original bulk of the raw material, and the remaining lint-free fraction is more than 65% richer in protein and approximately 100% richer in fat content. The lint removed from the milled product is relatively clean and suitable for use in the cellulosic industries where short fiber length is unimportant (cellulose derivatives). 12 references. E.S.

GUMS AND RESINS

SANDERMANN, WILHELM. Studies on resins. XIII. Specific color reaction for dehydroabietic acid and its application in analysis of technical resins. Anal. Chem. 21, no. 5: 587-9 (May, 1949).

The author describes a new specific intensive blue-violet color reaction which has been used to detect dehydroabietic acid in various resin products. A resin containing dehydroabietic acid is sulfonated in the cold and, after standing 12 hours at room temperature, is neutralized with concentrated sodium hydroxide or potassium hydroxide. A blue-violet color appears; the intensity varies with the amount of dehydroabietic acid in the sample. E.S.

INSECTS AND VERMIN

CHAKRAVORTI, S. Effect of "Gammexane" on the durability of paper. Nature 163, no. 4146: 607-8 (April 16, 1949).

The use of Gammexane (I) has been recommended for controlling insect pests in libraries and record offices, particularly in tropical climates. Since no information on its effect on paper was available, No. 2 Gammexane smoke generators were used at a concentration of 2 oz./1000 cu. ft. (as recommended by the manufacturers, Imperial Chemical Industries, Ltd.). Samples of paper were exposed to the smoke for 72 hours, care being taken to prevent any scorching effect from the smoke generator. The exposed samples were afterward subjected to accelerated aging by heating for 72 hours at 100° C. Tensile strength and folding endurance were then measured by the standard TAPPI procedures. The mere exposure to (I) smoke brought about a substantial decrease in tensile strength and folding

endurance of the samples—as much as 53.7% and 71.5%, respectively, in one instance. Papers exposed to (I) and then submitted to accelerated aging turned slightly yellow with a complete loss of folding endurance in nearly all cases. All-rag handmade paper of an extremely durable quality with a folding endurance of 4164 had this property reduced to 28.5% on exposure to (I) and further decreased to zero on accelerated aging. These data prove conclusively that treatment with the No. 2 Gammexane smoke generator is definitely injurious to paper records of all kinds. E.S.

INSTRUMENTATION

SHOLL, H. A. Instrumentation for papermaking and converting. Paper Trade J. 128, no. 18: 17-20 (May 5, 1949).

Consideration is given to the liquid level recorder, instruments for stock blending, pH control, size preparation, chemical measurement, stock control, paper-machine pH control, machine-speed recorders, the drying process, moisture control, weight and caliper measurements, and gloss recorders, and to those controlling measurable variables in the converting process. The author warns against specifying instruments because someone else is using them in what seems to be a similar set-up. Experienced instrument engineers should be called in to discuss the problem. Diagrams are given of a method for pH control on the machine wet end and for temperature control of the coating drier. R.R.

SNYDER, A. G., and SHOLL, H. A. Instrumentation helps assure uninterrupted production of uniform quality stock. Paper Mill News 72, no. 21: 50, 62 (May 21, 1949).

The typical instrumentation for one type of pulping and refining system now in use is described. Included are ElectroniK wattmeters for indicating and recording motor loads on the pulper, refiners, and jordans; air purge-type measuring systems for recording stock levels within the pulper, mixing tanks, and jordan chest; electric flow meters for indicating and recording the flow rate of water to the pulper and the total flow units measured over any given period of time; and control cubicles designed to accommodate all necessary signal lights, push buttons for the control of pump motors and remotely operated valves, and any other control devices required for the over-all operation of the entire process. R.R.

LIGNIN

AULIN-ERDTMAN, GUNHILD. Ultraviolet spectroscopy of lignin and lignin derivatives. Tappi 32, no. 4: 160-6 (April, 1949).

After reviewing earlier work on the ultraviolet spectroscopy of lignin, particularly the work of Lange who proved that lignin exists in wood as an aromatic compound, the author, with the help of numerous absorption spectra, shows the relationship between the spectra of lignin and lignin derivatives and those of known compounds, and the effect of sulfonation of lignin on its ultraviolet absorption spectrum. The results demonstrate that sulfonation does not cause any drastic change in the chemical structure of lignin. 18 references. F.E.B.

BAILEY, A. Adsorption chromatography of lignin. Paper Ind. 31, no. 2: 205-9 (May, 1949).

The adsorption of various lignin preparations on cellulose (filter paper) was shown to be a general phenomenon occurring with unrelated lignins

and from a variety of solvents. All preparations separated into zones which were chromatographically heterogeneous, the number of such zones varying with the lignin preparation and the solvent used. The adsorption techniques are described in detail and various chromatograms (using visible and ultraviolet light) are reproduced. The lignins used were: a butanol-sodium hydroxide lignin prepared from western hemlock and dissolved in dioxane (I), a hardwood alkali lignin (Meadol) dissolved in dioxane (II), and a commercial sulfite waste liquor from western hemlock, distilled under a vacuum and dissolved in distilled water (III). After these preparations were allowed to dry on the filter paper, the best chromatographic differentiations were obtained with the following solvents: for (I)—methanol, ethanol, butanol-methanol, aniline, benzyl alcohol, benzaldehyde, quinoline, Phenyl Cellosolve, and furfural; for (II)—methanol, ethanol, acetone, quinoline, tetrahydrofuran, benzyl alcohol, benzaldehyde, and Phenyl Cellosolve; and for (III)—benzaldehyde and triethanolamine. L.E.W.

BRAUNS, F. E. Lignin. Fortschritte der Chemie organischer Naturstoffe 5: 175-240 (1948). [In English]

The author reviews the researches on lignin for the period of 1939-1948 under the main headings: occurrence, formation, and detection; isolation of lignin; properties and conversions of lignin; and the structure of lignin. 333 references. E.S.

KIPPHAN, K. Lignin from the wood saccharification process as a raw material for artificial resins. Kunststoffe 39, no. 3: 71-2 (March, 1949). [In German]

The production of lignin in the wood-saccharification process, its use as a raw material for the manufacture of artificial resins, and the properties of such resins are discussed briefly. F.E.B.

KLEINERT, TH. Adsorption reactions with lignin substances. III. The adsorption of sulfurous acid. Montash. 80, no. 1: 135-9 (February, 1949). [In German] *cf.* B.I.P.C. 11: 319.

The adsorption of sulfurous acid from dilute aqueous solutions by sprucewood and lignin isolated with dilute sulfuric acid at elevated temperatures and with 42% hydrochloric acid was investigated. It was found that the adsorption follows the equation of Freundlich. In the bisulfite cook of wood, the lignin adsorbs sulfurous acid before sulfonation. The inhibiting action of compounds on the pulping by bisulfite also depends upon adsorption phenomena. 14 references. F.E.B.

KLEINERT, TH. Adsorption reactions with lignin substances. IV. The adsorption of aldehydes. Montash. 80, no. 1: 140-3 (February, 1949). [In German]

An investigation of the adsorption of formaldehyde and furfural from very dilute solutions by acid lignins (isolated by dilute sulfuric acid at elevated temperatures and with 42% hydrochloric acid) showed that the absorption of formaldehyde follows the law of Henry and corresponds approximately to the solubility equilibria. The adsorption of furfural follows Freundlich's adsorption isotherm. F.E.B.

SORGATO, HIPPOLYTE. Plastic properties of lignin. Chimie & industrie 61, no. 4: 345-8 (April, 1949). [In French]

For a number of years plastics having a lignin base have been manufactured in Venice in two industrial plants. Their operations depend upon preliminary pilot plant studies made by Meneghini and Sorgato at the University of Padua where a high-grade thermoplastic, readily dispersed alkali lignin was prepared. The steps (although outlined) are not given in any detail. Under pressure the lignin melts at 150-170° C., depending on its moisture content. The author claims that in his processing, aliphatic hydroxyl groups are in part eliminated and phenolic groups are enhanced. Unless treated further, this lignin serves largely for laminating purposes. Up to 35-45% lignin may be used with unbleached pulps, and by heating under pressure, laminates can be made, the physical properties of which resemble those obtained from phenolic resins. Attempts to render lignin thermostable by introducing phenol followed by formaldehyde were unsuccessful. On the other hand, alkali lignin can be hardened ("polymerized") by means of formaldehyde, especially by condensing colloidally dispersed lignin under slight pressure in an autoclave with formalin. The resultant "formolignin" is obtained as a soft friable mass which can be calendered but to which small amounts (2-3% or more) of a suitable resin must be added to give the proper degree of plasticity. The modified formolignin can then be mixed with wood meal [so that the mixture contains about 40% lignin and a fairly high moisture content (20-25%)] prior to molding. Properties of the resultant product are compared with those of products in which phenolic resins were used. In general, these are favorable although dielectric properties were inferior. Cost figures are distinctly advantageous. Furfural-lignin polymerization products may also be prepared. These have unusual properties and, under certain conditions (based on concomitant polymerization of the furfural), they lead to autoresinification. Molding powders containing furfural-lignin have good dielectric properties. 11 references. L.E.W.

MACHINERY—BEATERS

MORDEN, R. BURKE. Quality plus economy with Stock-Maker's versatile fiber-beating. Paper Mill News 72, no. 21: 56, 58 (May 21, 1949).

Consideration is given to the performance and advantages of the Morden Stock-Maker. Flow diagrams are included to illustrate ways in which it is used and how it can be incorporated into existing or new systems of stock treatment. R.R.

TAIT, WILLIAM. Beaters and beating. Paper-Maker (London) 117, no. 4: 272-3, 275-7 (April, 1949).

For large runs on uniform stock continuous beating or refining may be the answer. However, in the average British mill, where relatively small batches are the order of the day and where a variety of papers are made from rag, wood, or esparto in various proportions, the hollander type of beater with its great flexibility must still be considered the best medium for stock preparation. Circulation and arrangement of the roll bars and style, spacing, and angle of bedplate bars are discussed in some detail, with particular emphasis on the importance of contact pressure between roll bars and bedplate, which has hitherto been neglected. It must be realized that one type of fiber will stand a much higher pressure than another, and that various fibers should be treated at different pressures during the beating operation to produce the desired qualities in the finished paper. In the case of mills using a variety of furnishes from hard rag to wood and esparto, it is necessary to have a beater in which the contact pressure can be controlled over a wide range. The author shows that, with careful selection of the tackle to meet the

individual requirements of the mill, the modern multiplate beater with a hydraulic or pneumatic pressure control system lends itself admirably to beater control and, hence, offers a means to higher efficiency. However, to reproduce the same beating cycle, identical conditions must exist on each occasion, including the characteristics of the furnish and consistency of the stock. The size of the beater to be employed will depend upon the individual mill requirements, the type and variety of fibers used, and the size of the average order which the particular mill receives. E.S.

MACHINERY—BELTING

ALLEN, SAMUEL L. Fast cementing of leather belting laps. Tappi 32, no. 5: 213-14 (May, 1949).

The author describes a method and the necessary equipment for accelerating the drying of waterproof nitrocellulose cement with infrared light in the lap of a leather belt when it is installed or shortened. He also summarizes the tests on which the method is based. Studies were carried out on a semiplant scale and showed that a minimum pressboard time of 10 minutes can be used and that the drying time should be approximately 30 minutes per ply of leather. The laboratory work involved studying the strength and speed of drying of various cements and such other factors as effect of viscosity, degree of nitration, percentage of solids, various plasticizers, and formulation of solvents on the most promising cements. It also correlates the quality and strength of a lap with the pressboard application time and the drying time with and without the use of infrared light. E.S.

MACHINERY—CONVERTING MACHINERY

ANON. "Bobst" Autoplaten cutter and creaser. Fibre Containers 34, no. 4: 127-8 (April, 1949).

A brief description is given of the salient features of a Swiss high-speed fully automatic platen press of high accuracy for boxmaking, incorporating feeders of the suction type, cutters and creasers, pile delivery, and a sheet counter, all devices equipped with control appliances. The machine is now being imported by H. H. Heinrich, Inc. New York. E.S.

BAUMGARTNER, J. R. New high-speed presses for blanking and creasing. Am. Paper Converter 23, no. 5: 12-13 (May, 1949).

A description is given of the Mercury Engineering Corp.'s K-series high-speed blanking and creasing presses. They work from roll stock or can be synchronized to draw directly from a web-type printing press. The web is carried through the feed mechanism into the die chamber without any marring or defacing and with accuracy at all speeds. Operation speeds of the three basic sizes range from 6000 to 18,000 blanks per hour, depending on the size of the machine. Companion K-series presses handle multiple web blanking of unprinted stocks at higher speeds and others are counterweighted and air cushioned for still greater speed on rule scoring and rule die cutting. R.R.

MACHINERY—ELECTRIC EQUIPMENT

LATIMER, ROBERT. Floor cables, drops eliminated in electrical plan. Am. Paper Converter 23, no. 5: 16, 39 (May, 1949).

A description is given of the wiring of a converting plant which eliminated overhead drops to supply power to machinery and floor cables. Underfloor grids for power supply cables were so arranged that each could be

tapped at any later date without unnecessary drilling or tieing up of floor space. The load centers consist of two-panel installations at regular intervals around the plant walls. Hundred-watt fluorescent double lamp fixtures were installed 18 inches above the bottom level of each truss along the roof supports. This improves the appearance of the plant and makes it possible to move huge stacks of paper cartons without striking the light fixtures. R.R.

OSCARSON, G. L. How to select large A-C motors for pulp and paper mills. Paper Ind. 31, no. 1: 61-3 (April, 1949).

There is usually one best selection for the application of a motor to fit the electrical conditions involved in pulp and paper machinery. The purpose of the present article is to clarify the load requirements and the electrical characteristics of various types of motors (synchronous, wound-rotor, or squirrel cage) as a guide for making the best selection for various types of equipment, including beaters and pulpers, jordans and refiners, chippers, grinders, hogs and shredders, motor-generator sets, compressors, and various types of fans and pumps. Motor enclosures for protection against splashing or falling particles, or for removing the heated air discharged by the motor, can be applied to any type of construction, whenever it is required. E.S.

MACHINERY—FELTS

PETERS, IRVING H. Felt length measurement using the Kenwood wheel. Tappi 32, no. 5: 229-31 (May, 1949).

When a papermakers' felt runs on a board machine where the felt must act as a power-transmission device, it changes in length by an amount dependent upon the load to which it is subjected. The Kenwood wheel is an instrument for measuring the felt elongation which affects operation and felt life. Excessive stretch is defined and suggestions for reducing stretch are mentioned. Examples are given to show how manipulation of the drives can change the amount of stretch obtained. The felt-length measurement is the only means of easily and accurately indicating loads applied to a felt. The use of this type of measurement becomes even more important on machines where electrical drives are employed than it has been on machines having older-type drives. E.S.

MACHINERY—PAPER MACHINE

BERGMANN. Assembly of the first postwar paper machine by J. M. Voith. Das Papier 3, no. 5/6: 88-9 (March, 1949). [In German] *cf.* B.I.P.C. 19: 554.

The first complete paper machine built after the war has been constructed by Voith for the French paper mill at Souche. The machine has been designed for making medium-fine printing and writing papers (40-240 g./sq. m.) at speeds ranging from 40 to 250 m./min. Details of the construction are mentioned briefly. E.S.

WINTGEN, KARL. Construct for uninterrupted operation; a study of the relationship between the requirements of mill operation and the construction developments in the pulp and paper industry. Wochbl. Papierfabr. 77, no. 4: 97-8 (April, 1949). [In German]

Paper-machine construction has not been able to profit from the advantages inherent in mass production. Before new paper machines are designed and built, the constructors and mill operators should consult frequently with each

other and the latter should give freely of their experiences. The points which should receive maximum attention are durable construction; suitable materials of construction, particularly where aggressive media are involved; adequate safety precautions; reliable lubrication; and convenient arrangement of all items requiring attendance, such as levers, handwheels, handles, etc. Moreover, shutdowns through frequent replacements caused by excessive wear should be avoided; the construction should always be considered from the angle of repairs; and all parts subject to wear should be as accessible as possible. These directions are based on actual operating experience and supplemented by examples involving further details. E.S.

MACHINERY—PASTING MACHINE

CAM, R. H. BOYCE. New range of semi-automatic self-adhesive tape sealing machines. Brit. Packer 11, no. 5: 26-7 (May, 1949).

A description is given of Rolatape semi-automatic sealers which can be used with both rectangular and cylindrical containers; self-adhesive viscose, ethylcellulose, polyvinyl chloride, polythene, or rubber hydrochloride tape is utilized. One model seals all shapes and sizes of containers which can be held manually on the taping platform; another is necessary for containers which are too thin to be held by hand. Average speeds of 15-20 containers per minute can be maintained. Illustrations are included. R.R.

MACHINERY—PUMPS

FORREST, F. R. Development of pumps for liquids within solids in suspension. Paper Mill News 72, no. 21: 53-4, 58 (May 21, 1949).

A discussion is given of Allis-Chalmers paper-stock pumps, including an explanation of flow characteristics of water, 3% groundwood, and 3% sulfite stock, a description of the pumps, and a history of their development. R.R.

MACHINERY—SLITTERS AND WINDERS

GOEBEL A. G., *Darmstadt.* Modern slitters and winders. Neue deut. Papier-Ztg. 3, no. 7: 289-90 (April 15, 1949). [In German]

A brief illustrated description is given of recent slitter and winder constructions, type "Rapid," particularly for the manufacture of narrow rolls. E.S.

MACHINERY—SUCTION BOXES

SPIER, WILLIAM, and BARRETT, W. A. British suction unit is introduced in America. Paper Ind. 31, no. 1: 58-60 (April, 1949).

An illustrated description is given of the Rotabelt suction unit which is designed to eliminate the friction between flat suction boxes and wires or felts. The Rotabelt is a device that transfers vacuum from a three-compartment suction box to the wire or felt by means of a perforated traveling rubber belt or sleeve. This sleeve runs over a series of polished stainless steel plates on top of the stationary box and is the only wearing part under ordinary conditions, its life depending upon operating features and vacuum. Several types of installations on Fourdrinier and cylinder machines are shown in diagrams. A recent unit for high-speed water removal incorporates a new type of honeycomb drilling of the rubber sleeve and a new design of box top. Another adaptation for easy cleaning on asbestos cement machines is special quick release doors at the ends of the unit—in this case normally with one compartment only. E.S.

MATERIALS HANDLING

RENARD, A. Native French raw materials and automatic handling in the paper industry. Papeterie 71, no. 4: 118-19, 121-3 (April, 1949). [In French]

A continuous papermaking operation has the distinct advantage of cutting labor costs. The author shows how this was done in the case of a mill producing two tons per 24 hours of high-grade (12 g.) carbon paper made from flax waste using two cutters placed in series, from which the fibers passed to two digesters (alternately charged and operated) for eight hours each and then discharged into suitable tanks which were themselves emptied every 12 hours. The subsequent pulp defibration, and the operation of a draining tank are discussed in some detail. The bleaching operation (in two units) is treated only briefly, as is the subsequent beating operation. The actual paper-machine operation (involving no new modifications) is barely mentioned. On the other hand, the over-all saving in labor is treated rather fully. Other applications to papermaking from commercial pulp laboratories and from pulps made from annual plants are outlined. 2 diagrams. L.E.W.

MATERIALS OF CONSTRUCTION

BARNES, R. T., JR., and CLARKE, K. H. J. Nickel alloys in pulp and paper making. Paper Mill News 72, no. 20: 26, 28, 30-2, 34 (May 14, 1949); *cf.* B.I.P.C. 18: 764-5.

The authors discuss corrosion and the use of specific nickel alloys in the sulfite, sulfate, and soda pulp processes in general and more particularly in liquor heaters; diffusers; alkali recovery; smelters; causticizing plants; by-product recovery from sulfite and sulfate cooking liquors; bleaching and brightening with chlorine and hypochlorite, peroxide, and zinc hydrosulfite; washing and thickening of brown stock, sulfite, groundwood, and lime sludge; and perforated and slotted screens. In regard to papermaking, corrosion and the use of nickel alloys are considered in stock handling and transfer, stock preparation, the Fourdrinier, and the press and drier sections. R.R.

METERS AND RECORDERS

SCHAER, JOHANNES. Power economy and steam-gage installations in paper and pulp mills. Das Papier 3, no. 5/6: 86-8 (March, 1949). [In German]

A somewhat critical evaluation of the article under this title by K. Engler (*cf.* B.I.P.C. 19:486). L.E.W.

NITRIC ACID PROCESS

ANON. The Day process. Papeterie 71, no. 4: 123, 125, 127 (April, 1949). [In French] *cf.* B.I.P.C. 18: 767; 19: 639.

The nitric acid processes previously discussed are reconsidered and in addition explanatory data are given on the nitric acid pulping of chestnut (without preliminary tannin extraction) and birch. Yields and strength tests are entirely satisfactory and the α-cellulose contents are also high. The pulps are remarkable in that beating prior to the papermaking operation becomes entirely unnecessary, thus effecting great power savings. From cost data given by the author, the Day procedure also permits an actual saving in the cost of chemicals, when compared with the monosulfite process applied to straw. L.E.W.

PAPER—ABSORBENCY

JACKSON, E. C., and ROPER, E. R. A water absorbency apparatus. Am. Dyestuff Reptr. 38. no. 10: 397-401 (May, 1949); *cf.* B.I.P.C. 12: 257.

An apparatus is described and diagrammed for measuring the absorptive properties of fabrics such as toweling, which would bear some resemblance to the end use of the fabric; paper might be substituted for fabric. The material to be tested is placed on a porosity plate and weighed down with a shot bag. Water below the plate is absorbed by the material, the amount being measured by the movement of the meniscus in a capillary measuring tube which supplies the water. By means of a suitable timing device the lapsed time for passage of the meniscus over a portion of a scale can be determined. The procedure, typical absorption curves, the variables which affect the results, the method of reporting results, and calibrations are considered.
R.R.

PAPER—COATED

ERICKSON, D. ROBERT. New coating process. Paper Ind. 31, no. 2: 184, 186 (May, 1949).

Reference is made to a new coating process discussed for the first time at the TAPPI Coating Conference, held in Grand Rapids in April, 1949. The process uses a small quantity of hydroxyalkyl cellulose (I) (a cellulose ether) as the binder. The ether is selectively soluble only in a critical concentration of aqueous sodium hydroxide and in no other solvents. By either increasing or decreasing the sodium hydroxide concentration or by exchanging the sodium ion of the sodium hydroxide for any other ion (such as ammonium ion, when ammonium sulfate is used as the precipitant), it is possible to change the fluid solution to a nontacky solid form. The coating mix is prepared of clay or any other suitable pigment, dilute sodium hydroxide as the solvent, and (I) as the adhesive, and applied to the coating raw stock by any of the known methods, preferably by one that does not apply a pattern. Immediately afterward, the wet surface is contacted by means of a dampening roll with a solution of a neutral or other salt, which will precipitate the (I) by ion exchange. The excess solution is removed by passing the sheet through squeeze or press rolls, such as those used on a size press. The sheet is then dried under tension to prevent cockle. The process provides a smooth level surface which does not follow the contour of the raw stock; the sheet may be used without calendering. The new process has not yet been tried on a full-scale machine; however, it has been thoroughly tested on a 10-inch web at high speeds (up to 1000 ft./min.) in a small-scale pilot operation. It has been successfully applied to many types of paper and board raw stocks with coat weights from 4-25 lb./ream. E.S.

OSBORNE, E. B. Application and use of Geon latices in paper field. Am. Paper Converter 23, no. 5: 10-11 (May, 1949).

The Geon latices (manufactured by B. F. Goodrich Chemical Co.) are water dispersions of polyvinyl chloride resins and are an important type of polymeric coating material widely used in the paper industry. Geon latex coatings and films are grease and water resistant, heat sealable, tough, colorless, tasteless, and nontoxic. The coatings adhere tightly to porous materials; on nonporous surfaces they are strippable, furnishing a strong, abrasion- and chemical-resistant wrap. The resin series contains no plasticizer and, with the exception of Geon latex 31X, must be plasticized to soften the resin particles so that continuous flexible coatings can be made. The plastic series differs from the resin in that plasticizer has been driven into the resin particles. Coatings can be fused at about 250-270° F.; plasticized resin latex coatings

require temperatures about 50° higher. The polyblend series consists of Geon resin latices plasticized with Hycar American rubber. Coatings made from these dispersions are water and grease resistant, resistant to many chemicals, and flexible at low temperatures. Of the familiar knife coaters, the blanket-type has been found most suitable for applying Geon to paper and boxboard. Spray-coating equipment, roll coaters, and brush coaters are also satisfactory means of application. However, the most suitable machine for applying Geon latex coatings is the air-knife type coater. Descriptions, supplemented by diagrams, are given of these coaters and their uses, and applications of the resulting products are mentioned. R.R.

PAPER—MERCHANDISING

JACKSON, LARS. Technical sales service for paper users. Paper Trade J. 128, no. 19: 21-2 (May 12, 1949).

The benefits to be derived from the liaison functions of a technical sales representative are outlined. The paper manufacturer is in many cases placed at a disadvantage by not having enough information as to the end uses of his paper. The technical sales representative can supply such information, review specifications, check orders for completeness from the technical angle, stress the need for sufficiently large paper samples, etc. He is the logical trouble shooter, who can do much to foster mutual understanding between paper-maker and paper user. E.S.

PAPER AND PULP INDUSTRY

ANON. Pulp & Paper presents its 1949 North American review number. Pulp & Paper 23, no. 5: entire issue (April 30, 1949); *cf.* B.I.P.C. 18: 849-50.

The 1949 annual review of the North American pulp and paper industry includes the following sections, listed by title and sub-title: Per capita consumption, world-wide trends, p. 50-3; General information, p. 53-4; Forecasts, p. 55-6; Stream improvement, p. 57-9; Expansion (Northeast U. S., p. 60-1; The Middle West, p. 61-2; Southern U. S., p. 62-3; Pacific Coast states, p. 63-4; Canadian expansion, p. 64, 178, 180, 182; Alaska, p. 182; Expansion in Mexico, p. 182, 184; U. S. A. exports of pulp and paper mill machinery to Latin America, p. 184; India to spend $17,000,000 in U. S. on mill machinery, p. 184); Payroll statistics, discussion of labor situation, p. 65-6, 68; Paper, p. 70, 72, 74, 76-7; Pulpwood (World pulpwood production, p. 78, 80, 82; Record by states in southern U. S., p. 82, 84, 86; Canada's forest resources, p. 88, 90; U. S. Forest Service's latest resources survey, p. 92; Far Western wood data, p. 94, 96); Pulp (6-yr. shortage over, p. 100, 102-4, 106-8, 110, 112; U. S. pulp statistics prepared by U. S. Pulp Producers Association, p. 112, 114); Fiber board, p. 118, 120, 122; Newsprint, p. 126, 128, 130, 132, 134, 136, 140; Financial, p. 142, 144, 146, 148, 150, 152, 154, 156; A survey of non-paper uses of cellulose ([General] p. 158, 160; Rayon, p. 160; Cellophane, p. 160; Nitrocellulose, p. 160; Plastics and derivatives, p. 160, 162; Miscellaneous uses, p. 162; Exports, p. 162; Summary, p. 162); Rayon, p. 164, 166, 168, 170; Plastics, p. 172. Most articles include important statistical data, supplemented by tables and charts. R.R.

BEE, EDGAR. Paper from hardwoods in Australia. Pulp Paper Mag. Can. 50, no. 5: 84-6 (April, 1949); Paper Ind. 31, no. 3: 343-5 (June, 1949); *cf.* B.I.P.C. 19: 563.

After briefly outlining the development of the Australian pulp and paper industry, based on the utilization of *Eucalyptus* species, and the difficulties

which had to be overcome, the author describes the formation of Australian Newsprint Mills Pty. Ltd. and the operations at the newsprint mill at Boyer, Tasmania, with an annual output of 31,500 tons. Newsprint is made from 80% eucalyptus pulp and 20% sulfite imported from British Columbia. Extensions to the Boyer plant, including a second newsprint machine, will double the output. Reference is also made to the fine paper mill of Associated Pulp and Paper Mills, at South Burnie, Tasmania, with an annual output of about 20,000 tons of fine printing and writing papers, ledgers, blotting papers, etc., some of which are made from a 100% eucalyptus furnish. The over-all percentage of imported bleached sulfite is only 5-6%, which is supplied from North America. The company has also a big expansion program under way, with an annual output of 30,000 tons by the end of 1951 as its aim. E.S.

DUTRUC, JAMES H. The French paper industry today. Paper Ind. 31, no. 2: 202-4, 213 (May, 1949).

The French paper industry is largely dependent on the importation of fibrous and nonfibrous raw materials and equipment; approximately 80% of all materials consumed must be obtained from foreign countries. There are about 300 pulp and paper mills in France today, employing nearly 60,000 people. The chemical pulp industry comprises only about 12.5% of the total output and of this quantity, 60% is made from imported woods. The author reviews briefly the manufacture of chemical and mechanical wood pulp and straw pulp, the latter having gained a great deal of importance during recent years. Stock preparation, paper machines, and finishing room practices are also discussed, and brief reference is made to modernization programs. The manufacture of wrapping papers in France is considered to be less important than that of newsprint and printing and writing papers. E.S.

EVEREST, D. C. Good paper business ahead. Paper & Twine J. 23, no. 2: 12, 16, 18-26 (April, 1949); Am. Paper Merchant 46, no. 5: 28-30 (May, 1949); Paper Sales 9, no. 5: 16, 32, 34, 36, 38 (May, 1949); Paper Trade J. 128, no. 14: 12-14 (April 7, 1949); *cf.* B.I.P.C. 19: 564-5.

The author asserts that this is a period of minor adjustment which is certainly not a forerunner of a serious change unless everyone is determined to make it so. Statistics are given to show the great increase in paper consumption during the past 10 years and a comparison of business volume between the present and 1948. Price structures should be kept in equitable relationship to costs. At present, because of labor costs and probable increases in taxes, there is no opportunity to reduce prices materially, nor will there be in the forseeable future. In conclusion, the author predicts that the 1949 consumption of paper and paperboard will equal or be very close to the 1948 level. This was given as an address to the National Paper Trade Association at its New York convention on April 5. R.R.

TINKER, E. W. Economic future of paper industry good. Am. Paper Merchant 46, no. 5: 25, 32 (May, 1949); Paper Sales 9, no. 5: 19-20, 44-5 (May, 1949); Paper Trade J. 128, no. 14: 14-15 (April 7, 1949).

In a speech to the National Paper Trade Association convention in New York in April, the author expressed the belief that possible increases in freight rates and taxes, a change in Social Security payments, and continued high labor costs will prevent any substantial downward trend in paper values.

No commodity manufactured in this country has a better economic future than paper and paperboard. Capacity growth has about kept equal to the normal demand which will expand, although at varying speeds, over a period of years. A sound conservative program, increased efficiency, and better techniques are necessary, even though they may cause some hardships within the industry. R.R.

U. S. BUREAU OF THE CENSUS. *Industry Division. Paper and Printing Unit.* Pulp and paper manufacture in the United States; summary for 1948. Tappi 32, no. 5: 18A, 20A, 22A, 26A (May, 1949).

A summary of the Bureau's monthly reports on pulp, paper, and board for 1948 is presented in tabulated form. The production of paper and paperboard was in excess of 22,000,000 tons, and that of wood pulp was more than 12,872,000 tons, in both cases an increase over 1947. E.S.

ZINK, JOHN. Outlook for 1949 in fine paper field. Am. Paper Merchant 46, no. 5: 26-7, 52 (May, 1949); Paper & Paper Products 90, no. 16: 2, 18-19 (May 5, 1949).

Because a very close relationship exists between the production of nondurable goods and fine papers, an estimate of the trend of general business helps to calculate what the fine paper business may be. A serious recession is not indicated unless the people of the country view its economic security in a false light. The time when paper consumption will be reflected directly in mill orders, the rate of consumption, and the prospect of a further increase in per capita and total consumption of paper must be considered as influencing the volume of writing paper in 1949. The favorable earnings of the industry for the first three quarters of 1948 are largely attributable to the high production rate; with the lower production expected for 1949, earnings will almost certainly be less favorable. Labor and coal costs have risen since the last price rise in paper. Although European pulp has decreased in price approximately to domestic prices, this is such a small part of what is consumed that it has little effect on paper-production costs. Since the abandonment of OPA, paper prices have increased much less than the index of all commodities. Therefore, it is evident that present manufacturer's prices for paper are not too high in relation to costs and that paper is a better buy in comparison with prewar levels than are other commodities. As in the past, the industry must sell with less emphasis on price and more on quality and service. R.R.

PAPER AND PULP INDUSTRY—EDUCATION

BEATTY, S. F. Paper selection course filling an important educational need. Inland Printer 123, no. 2: 72 (May, 1949).

The activities and scope of the paper selection course given by the Graphic Arts Association of Illinois, Inc., are briefly reviewed. Subjects given in the 16 evening sessions include paper history; a study of the various kinds of papers; the relationships between paper and the printing plate, ink, and the three main printing processes; paper testing; paper in the bindery; and paper troubles and their solution. Experts in each field are brought in as guest speakers and movies are used. Actual specimens of the papers being discussed are distributed among the students. R.R.

LEVÓN, MARTTI. The centennary of technical education in Finland. Finnish Paper Timber J. 31, no. 7 A: 45-6 (Special issue, April, 1949). [In English]

The author reviews briefly the various stages in the development of technical education in Finland, particularly as it concerns the study of wood and paper technology. The modest beginning was the opening of a technical school in Helsingfors on Jan. 15, 1849, which developed eventually into the Institute of Technology, Finland's leading institution as regards the education of engineers and architects. However, it was not until the reorganization of the Institute in 1942 that an independent industrial engineeering section was established with the chief object of training technical manpower for the wood-using industries. E.S.

PAPER AND PULP INDUSTRY—PUBLIC RELATIONS

PALMER, FRED L. A limited edition of 115,000 copies. Print 6, no. 2: 4-11 (1949).

To help its 30,000 employees to see more clearly what it was doing in 1948, its fiftieth year, the International Paper Co. developed a program which included the publication of an anniversary book with the subtitle "A portrait of International Paper Company." The volume was made available to all company employees, stockholders, customers, and men and women of prominence in the industry and in the communities where the company is doing business. The book is remarkable from a design and production viewpoint; some of the technical printing and details are described. Examples of illustrations are included. From the angle of public relations printing, the company was notably successful. By producing an exceptional, high-quality book, the standards of the company and the quality of its products were emphasized. One of the significant discoveries of the undertaking was the fact that limited-edition quality in printing can be obtained at moderate cost through mass production. R.R.

PAPER AND PULP MILLS

ANON. Coosa River construction 40 percent complete. Paper Trade J. 128, no. 19: 17-19 (May 12, 1949); *cf.* B.I.P.C. 19: 101.

The present status of the construction work on the Coosa River newsprint mill is shown in 12 pictures, indicating that the project is more than 40% complete. The start of operations is expected early in 1950. E.S.

ANON. How Baie Comeau set record; visit to Quebec mill. Pulp & Paper 23, no. 6: 35-6, 38, 40, 42, 45 (May, 1949).

With reference to the speed race between the new Corner Brook and Powell River newsprint machines built for 2000 ft./min., attention is drawn to the fact that the two paper machines at the Baie Comeau mill of the Quebec North Shore Paper Co. still hold the present record for speed. Their best speed has been 1730 ft./min.; their present average is 1650 ft./min. These machines were designed for slightly less than the speeds at which they are operating now, whereas the two new machines installed last fall were actually designed for speeds up to 2000 ft./min. However, there are always troubles to be ironed out in starting up new machines and it may be months before they reach or surpass the record of Baie Comeau. A brief general illustrated description of the Baie Comeau mill, its equipment (including the two machines), and personnel is given; tabulated data on the best speed records of the two newsprint machines are included. E.S.

ANON. Progress at Thilmany. Paper Ind. 31, no. 1: 51-6, 63 (April, 1949).

A profusely illustrated description of the modernization program of the Thilmany Pulp and Paper Co. at Kaukauna, Wis., is given. The two big projects were the installation of a new specialty combination Yankee paper machine built by Beloit and a new Babcock & Wilcox four-drum bent-tube boiler at the lower mill. A new warehouse and garage have also been constructed, together with numerous installations of new equipment throughout both mills. E.S.

STEPHENSON, J. N. Integrated industry at Gatineau; Canadian International Paper Company aims at complete use of forest growth. Pulp Paper Mag. Can. 50, no. 5: 70-83 (April, 1949).

An illustrated description is given of the several wood-using plants of the International Paper Company at Gatineau, Que. The products of this huge concentration of industry include newsprint paper, bleached sulfite pulp, Ten/Test building and insulation boards, Masonite building products, plywood panels, ethyl alcohol, and magnesia insulation material. Except for the alcohol and magnesia plants, the various units are owned and operated by the Canadian International Paper Co. or a subsidiary company. E.S.

PAPER AS A TEXTILE MATERIAL

PENNENKAMP, OTTO. The economical spinning of paper yarns. Das Papier 3, no. 5/6: 89-91 (March, 1949). [In German]

The operation and advantages of the disk spinning machine are discussed briefly. L.E.W.

PAPER CONDITIONING

ANON. Atmospheric humidity affects quality and output. Brit. Printer 61, no. 366: 28-32 (May-June, 1949).

The most persistent and expensive fault in machine rooms not air conditioned is bad registration in color work. If the paper is too dry or if it is brought from a cold warehouse into a warm machine room and used at once, it will become charged with static electricity and never produce a first-class job. Uneven moisture content between the edges and center of the sheets results in wavy paper which cannot be printed satisfactorily. Paper that is too dry is hard, lacks the resilience necessary for perfect work, and gives rise to plucking, poor inking, and chalking. Badly matured paper often causes clogging. The proper humidity not only makes the paper easier to print, but also lengthens the life of the rollers. Of the suggestions given for overcoming these difficulties, the most satisfactory is the installation of a modern air-conditioning plant. A temperature of 20° C. and a relative humidity of 65% are best for storing and manipulating paper. Two diagrams and four illustrations are given to show the effects of poor humidity on printing, the latter depicting creasing, a clogged halftone block, plucking, and slurring. The article is translated from a Swiss publication entitled "Climat et papier." R.R.

PAPER SPECIALTIES

ANON. Gift trends. Modern Packaging 22, no. 9: 83-9, 187-8 (May, 1949).

Gift packaging this year must be planned for fast selling and correct pricing. The present trend is toward gift packaging that is suitable for year-round sales. Regular stock packages with a special gift wrap or outer sleeve which can be removed after seasonal promotion are popular. There is also more emphasis on "interim gifts." Almost every kind of packaging material

is now available, although at prices which are expected to remain high for some time. There is a growing demand for exclusive patterns. Design themes show a slight preference for pastels, Victorian motifs, and romanticism; high gloss finishes, which resist dirt and wear, are popular. Plastic packages are available in greater variety than ever; many are combinations with paperboard, metal, and leatherette. Films and foils, a new plastic lace, cellulose tape, and various ribbons are likewise popular. Many companies are showing interest in gift packages of their own products for friends of the company, using special containers for this purpose. Numerous illustrations of gift packages are given. R.R.

DAY, FREDERICK T. Waterproof wrappings reviewed. Brit. Packer 11, no. 5: 28-9 (May, 1949).

Descriptions are given of Ibeco, Scutan, and Sisalkraft papers, which are specially treated kraft wraps and liners. Sisalkraft is sometimes used for direct wrapping with no outside containers; it is also available as a very tough gummed tape. Combinations of Sisalkraft with aluminum (Sisalation) and copper, and specialty wraps such as transparent films, vegetable parchments, and greaseproof papers are also briefly discussed. R.R.

GATES, P. G. Frozen foods. J. Inst. Packaging no. 2: 10-14 (Summer, 1948).

Following a general discussion of frozen foods and the methods of quick freezing, the author reviews the requirements of packaging materials and the advantages and disadvantages of waxed board, waxed paper, parchment and greaseproof, cellulose film, and rigid metal and metal-end containers. Packages used for prepackaged frosted food must cope with wet sticky syrup and fruit; those used with free-run frosted food must withstand the sudden ingress of hard sharp pieces. The quick-freezing packaging must be moisture-vaporproof and therefore airtight, which means that the freezing rate is reduced by 40%. Heat sealing is the preferable method and must be very close or the fruit juices, which are still liquid at sub-zero temperatures, will stain the wrap. The frozen-food industry needs cheaper packaging and lower processing costs. A package for prepackaging processors which will permit the flow of convective currents, can be easily stacked while waiting to be put into the freezer, will retain fruit and syrup, and can be easily sealed after freezing, would effect a considerable reduction in processing costs. Laminates should reduce packaging costs, as should the use of a flexible bag for free-run freezing. A pack which has been used successfully consists of an inner and outer sheath of 0.3 cellulose film with sufficient air between to form a dead-air barrier. The American poultry package of a synthetic-rubber-film bag from which the air is withdrawn seems the only hope of an ideal poultry package. R.R.

PATENTS

MAKARA, FRANK. Inventor, employe, employer relationship. Paper Trade J. 128, no. 21: 24-5 (May 26, 1949).

It is to the benefit of corporations to have all employees contract to assign all inventions pertaining to the general business of the corporation whether or not they were developed during company hours, or with company material, or even if reduced to practice after the employee resigns or is discharged, provided that no interference in obtaining a livelihood results. Occasionally an inventor is forced to assign his invention even though there is no such stipulation in an employment contract. If the employer regularly sells items such as the one patented, they may be made and sold from the shop where the inven-

tion was made. Such a shop-right is transferable only with the shop as a whole. If the invention made on company time and with company tools is wholly unrelated to the corporate business, then no shop-right exists. Where there is no contract to assign and the work is done on the inventor's time and with his tools, the invention belongs to the inventor, even if it is applicable to the company's business. An invention can be sold, given away, etc., even though it is not patented or patentable; a patent application is assigned by reciting the serial number of the application and its date. Employer-employee relations relating to professors and collegiate institutions are unsettled. Patent Office personnel are not allowed to apply for patents and they cannot acquire financial interests in patents except through inheritance. Because any patent is lawfully granted only to the true inventors, the inclusion of a noninventor, such as the employer or financier, technically invalidates the patent. R.R.

MAKARA, FRANK. Trade secrets. Paper Trade J. 128, no. 19: 22-3 (May 12, 1949).

The author discusses the difference between trade secrets and patent protection, showing the disadvantages of the former. The day of trade secrets in business is practically obsolete, because large corporations are not structurally built to keep such secrets, calling for an everlasting and extreme degree of vigilance. An inventor has the choice between a trade secret or a patent for making a profit from his invention, but having elected one system, he must stick to it. If a secret user of an invention decides to patent it after a number of years, the Patent Office will not grant a patent on the application if it knows about the secret use or, being ignorant about this fact, may grant a patent and later declare it invalid, if an infringer should set up a defense of concealed use. E.S.

PHYSICAL TESTING—CELLULOSE—ACCESSIBILITY

HOWSMON, JOHN A. Water sorption and the poly-phase structure of cellulose fibers. Textile Research J. 19, no. 3: 152-62 (March, 1949).

Many of the methods used to study the fine structure of cellulose are tedious and not suitable for routine use. In the present work, an equilibrium moisture-regain method which can be carried out on a large scale with a high degree of accuracy has been developed. The method is illustrated by a wide variety of cellulose materials covering a wide range of moisture sorption capacity. The terms "accessibility" and "crystallinity" are discussed and possible errors arising from the assumed equivalence of these terms are pointed out. A preliminary attempt to evaluate both accessibility and crystallinity of cellulose from moisture regain data has been made. This evaluation results in a proposed revision of the scale of reported crystallinities of various types of cellulose. The hydrolysis method for studying cellulose accessibility has been compared with moisture regain and x-ray diffraction methods. It is proposed that recrystallization of cellulose during hydrolysis is a determining factor in this method and, therefore, that published data obtained from hydrolytic studies should be reconsidered. 35 references. E.S.

PHYSICAL TESTING—PAPER—GLOSS

SMITH, DANIEL. Problems in gloss evaluation. Interchem. Rev. 7, no. 4: 95-108 (Winter, 1948-49).

A qualitative discussion of the gloss of objects is followed by a brief presentation of the principles of geometrical and physical optics that relate to

gloss. The various types of gloss (subjective classification) as defined by ASTM are quoted and the author points out that: "The fact that gloss must be classified into five types indicates a lack of sufficient knowledge to unify the whole subject. It would be desirable to have a single method for the measurement of gloss which required no preliminary visual inspection and special procedures, just as these are not required in the measurement and specification of color on the basis of spectrophotometric characteristics." Instruments for the measurement of gloss are incompletely reviewed. Goniophotometry is discussed as a fundamental approach to the problem of gloss. The author stresses the fact that suitable instrumentation can be developed only after psychophysical studies and correlations have been made. 61 references. J.A.V.

PHYSICAL TESTING—PAPER—PRINTABILITY

ST. JOHN, EUGENE. Good "workability" of paper stocks an essential factor in smooth pressroom production. Inland Printer 123, no. 2: 68 (May, 1949).

Printing papers are commonly graded and compared according to how they feed on the press, as determined by the number or absence of imperfect sheets which may cause stops, trips, etc. Other qualities are worth little if the sheets cannot be fed continuously and smoothly. The precision proof press affords the most reliable and economical comparator. It is made as nearly foolproof as possible, so that others in addition to experierced pressmen can use it for testing paper printability. Strips of two papers, one with known printability qualities, are fed through the press at the same time. Any difference in printability will show; exposure to warm air for a few hours will reveal any difference in resistance to ink drying. If an ink proves unsuitable for the paper being tested, it is more satisfactory to correct the ink than to test and discard papers until the right one is found. The supreme test is that of appearance, which involves not only the appearance of the paper but also of the type and halftones printed on it. The proof press may also be used for comparing the light reflectance of papers, or a Leeds and Northrop recording micro-densitometer may be utilized. The appearance of black and color halftone prints is improved by the whiteness of papers and by opacity. R.R.

PHYSICAL TESTING—PAPER—SIZE RESISTANCE

FIELDEN, JOHN E. A new electronic moisture meter. Proc. Tech. Sect., Paper Makers' Assoc. Gt. Brit. & Ireland 28, no. 2: 513-21; discussion 21-4 (December, 1947).

The author describes briefly a new electronic moisture meter which has already found wide application in the textile industry and which may be equally useful in the paper industry. The method of operation, calibration, and limitations of calibration accuracy are discussed. In conclusion, an auxiliary electronic equipment is described, which enables the moisture meter to control many industrial processes automatically. 4 illustrations. E.S.

WILSON, W. S. Why size paper? Paper Mill News 72, no. 21: 80-2 (May 21, 1949); Paper Ind. 20, no. 10: 1514, 1516, 1518, 1520, 1522 (January, 1949); *cf.* B.I.P.C. 19: 498.

A discussion is given of engine sizing and the fact that it apparently has no effect on the water-absorbing characteristics of the interior of paper fibers. Figures are given and explained which show water and ink penetrations on sheets containing increasing amounts of rosin, the influence of the amount of size on permeability, and the apparent dependence between wet-break tests and equilibrium-water pickup. R.R.

PHYSICAL TESTING—PAPER—STRENGTH

VILARS, J. Method of graphically representing pulp and paper strength. Papeterie 71, no. 4: 127, 129, 131, 133 (April, 1949). [In French]

In the case of beaten pulps instead of plotting breaking length or tear against time (or degrees S.-R.), it was more effective to plot breaking lengths (or burst) against tear. Numerous curves are given and their advantages are discussed from the standpoint of a practical evaluation of the beating operation. L.E.W.

PHYSICAL TESTING—PAPER—VAPOR TRANSMISSION

WINK, W. A., and DEARTH, LEONARD R. Measurement of water-vapor permeability at low temperature; the hygrometric sweep gas method. Tappi 32, no. 5: 232-8 (May, 1949); Modern Packaging 22, no. 9: 134-8, 188, 190-1 (May, 1949).

Because of the difficulties in the measurement of water-vapor permeability of vapor-resistant barriers at low temperatures by means of the gravimetric method, new equipment, based on the hygrometric sweep-gas method, has been developed and is described. The new method has been made possible by the recent development of very small, sensitive, and stable electric hygrometers. The sensitivity of the new method results from a combination of the inherent sensitivity of the hygrometric principle and the ability of the small electric hygrometer to measure accurately small changes in the relative humidity of the air passing over a specimen. The sweep-gas method is of the steady-state class and is free of error at equilibrium arising in sorption effects. The sensitivity of the new method is sufficiently high that the length of time required to complete a test is limited only by the nature of the material, especially as the latter determines the time required for the specimen to attain equilibrium with the relative humidities of the air in contact with its two sides. The operation of the new equipment is illustrated by the performance on several samples of different types. E.S.

PHYSICAL TESTING—PAPER—WET STRENGTH

BRIDGE, F., and HARRISON, H. AINSWORTH. Further experimental results on the K.B.B. galvanic sizing tester. Proc. Tech. Sect., Paper Makers' Assoc. Gt. Brit. & Ireland 28, no. 2: 661-70 (December, 1947); *cf.* B.I.P.C. 19: 497-8.

The paper is intended as a reply to the criticism of Harrison, Banks, and Poulter of the staff of PATRA. The present authors agree that the two electrodes of the galvanic sizing tester develop a potential which is variable when measured by the methods used by the PATRA workers. Their methods of measuring this potential, however, are divorced from the normal operation of the instrument. When methods are used which measure the potential at the end point under conditions which very closely resemble those under which the instrument is normally used, the potential across the paper under test was found constant within $\pm 2.5\%$. This is probably the underlying reason for the consistent results obtained on any one galvanic sizing tester and for the good correlation between a number of instruments. It would appear that the changing resistance of the paper is a more important controlling factor than the total e.m.f. which the cell is capable of developing on an open circuit. At the current flow which the authors have suggested as the end point, papers are almost invariably graded in the same order. Reasons have been given why a current flow of less than 80 microamp is not recommended. The PATRA workers have only shown that ranking of papers becomes variable when cur-

rents very much greater than 80 microamp. are involved. This cannot be accepted as a criticism of the instrument, however, since at such a high current, flow conditions prevail which do not exist or exist only to a negligible extent under the normal testing conditions. Since water vapor as such is probably an insulator under conditions prevailing in the instrument, it cannot lower the resistance of the paper. If condensation of water from water vapor occurs, this is surely an integral part of the mechanism of water penetration through paper. Measurements of water vapor-permeability rates through paper have failed to reveal any correlation with the sizing test as measured on the galvanic instrument. Although the authors agree that there is still a certain amount of arbitrariness about the end point, they are firmly of the opinion that it is less arbitrary than any of the procedures thus far recommended and, for this reason alone, the method represents a distinct improvement in the technique of measuring the water-penetration rate (or sizing) of paper.

E.S.

PHYSICAL TESTING—PAPER—WOOL

GRAFF, JOHN H. Microscopical analysis of wool-content papers. Tappi 32, no. 5: 212-13 (May, 1949).

The percentage of wool in unsaturated roofing felts as determined by the microscopic method (using a weight factor of 3.10) was found to agree fairly well with the wool content found by the Kjeldahl method. E.S.

PLASTIC FILMS (NONCELLULOSIC)

MCCORMICK, JAMES H. Designed for packaging. Dupont Mag. 43, no. 3: 28-9 (May-June, 1949).

Many difficult packaging problems are being solved by the use of polythene, a white or colored translucent plastic with a somewhat waxy appearance available from processors as sheeting, seamless tubing, molded containers, etc. It is extremely resistant to solvents and chemicals, remains flexible in sheet or film form at both high and low temperatures, and is water and moisture impermeable. R.R.

WITCO CHEMICAL COMPANY. Polyethylene bags for carbon black. Chem. Ind. 64, no. 5: 812 (May, 1949).

Bags made of 0.003-gage polyethylene sheeting and tied with a polyethylene cord have been developed for packaging and shipping carbon black. When the carbon black is used in the preparation of a rubber mix, the bag and its contents can be thrown into the Banbury where, at 200°, the polyethylene disappears completely. Another advantage lies in the waterproofness of the bags. They stand up satisfactorily under shipping conditions and are lightweight. They are made to hold 25 or 50 pounds. R.R.

PLASTICS

PENN, WILLIAM S. A new thermoplastic. Brit. Packer 11, no. 5: 33, 39 (May, 1949).

Fibrenyle, a new thermoplastic resin and fiber material now available, has been used successfully for making typewriter and instrument covers, flooring, and suitcases. The material is shaped on inexpensive forms by hand pressure and heated in any oven which does not have an open flame. The product is hard, strong, and very light in weight and can be finished with lacquer, varnish, or paint, or covered with wood veneer, paper, etc. R.R.

PRINTING AND PRINTER'S INK

HAMADR. Are printing papers able to influence the drying rate of printing inks? Neue deut. Papier-Ztg. 3, no. 7: 290-3 (April 15, 1949). [In German]

In order to assist in the solution of the problem of why printing inks dry better on certain papers than on others, the author reports systematic experiments carried out with 41 liners separated from the fillers of imitation chromo board obtained from five different manufacturers. All samples were known by code numbers only during the testing procedures. The physical, chemical, and microscopical properties of the samples were studied and a relationship was sought between the results and the ink-drying rate of the boards. The methods employed are described in some detail, as well as the practical printing experiments carried out in two series. All boards were arranged in the order of their thickness and the amount of ink applied was adjusted accordingly. In the first series all samples were printed on a litho hand press with the identical ink without the addition of siccatives. The gradual drying was observed for a number of days, and the degree of drying was ascertained by wiping over the prints with the finger. This somewhat primitive method was supplemented by a second series of experiments, in which the samples were printed on a high-speed offset press, left lying for 24 hours in the same room, and then covered with a calendered paper sheet, whereupon both were run through a proof press. Both series gave identical results and ranged the samples in the same order. The boards could be divided into five groups (class 1, perfectly dry; class 2, traces of impression; class 3, distinct impression; class 4, complete counterproof; and class 5, no drying after several days). Correlating these observations with the previous testing results, it could be stated that neither pH, ash, absorbency (spreading of an ink blot), or furnish seem to exert an influence. Type of sizing and sizing degree did not allow definite conclusions to be drawn, with the exception of starch sizing, which seemed to have a beneficial effect upon the drying rate. Bleaching (degree and uniformity of bleaching, as well as bleaching procedure) and uniform beating degree throughout the sheet produced the best results. The boards which exhibited the most suitable properties were all made by the same manufacturer.
E.S.

WATSON, JACK. What's ahead for news ink? Am. Ink Maker 27, no. 5: 25-8 (May, 1949).

The news ink of the future will dry instantly on the paper to eliminate offset, smudge, and rub off, will not mist, will print with greater clarity and contrast, and will transport and store in bulk. The author discusses the composition of the present inks, instruments developed in recent years to permit the more accurate measurement of various ink properties, inks which have been developed for other fields—heat-drying letterpress, moisture-set, water-based gravure and aniline, and filtration inks—and their possible application to the newspaper industry, and newsprint problems. R.R.

RAW MATERIALS—NON-FIBROUS

POOR, EDWARD N. Nonfibrous raw materials report—1948. Tappi 32, no. 5: 28A, 30A, 33A-4 (May, 1949); *cf.* B.I.P.C. 18: 461-2.

Brief reports on the demand and supply situation, price trends, and consumption are given for the following chemicals and nonfibrous raw materials used in the paper and pulp industry: caustic soda, soda ash, lime, chlorine, sulfur, rosin, casein, alum, sodium aluminate, sodium peroxide, starch, glue,

dyestuffs, clay, zinc sulfide pigments, wax sizes, defoamers, synthetic resins, starch-converting enzymes, plasticizers, glycerin, invert sugar, sorbitol, urea, and sodium nitrate. E.S.

RAYON—VISCOSE PROCESS

HESS, KURT, and HEPP, HELMUTH. The xanthation of alkali cellulose. III. The behavior of Na-Cell II as compared with that of Na-Cell I. Melliand Textilber. 29, no. 9: 305-10 (September, 1948). [In German] *cf.* B.I.P.C. 1, no. 7: 6; 2: 310.

Hess and Trogus have shown in the two previous papers that the xanthation of sodium cellulose under general manufacturing conditions (carrying out the reaction of Na-Cell I at ordinary temperatures) is confined to the micellar surface of the fiber. The reaction has now been studied with the thermostable Na-Cell II at elevated temperatures. In this case, the volume phase of the micelle also reacts, leading to a new crystal lattice formation which can be identified by the x-ray diagram. The reaction was followed by the x-ray method and determinations of the degree of xanthation by the methods of Fink and co-workers (*cf.* B.I.P.C. 5:46) and Bredeé (*cf.* B.I.P.C. 12: 416). The Na-Cell II absorbs carbon disulfide at ordinary temperature to a very limited extent only. The dexanthation which can be observed, particularly at elevated temperatures, is an after-reaction independent of the xanthation. A comparison of the x-ray diagrams of products with similar degrees of xanthation shows that the xanthation reaction takes place heterogeneously and not quasi-homogeneously. A critical discussion of methods for determining the degree of xanthation is included. 9 figures, 6 tables, and 16 footnotes. E.S.

RESEARCH LABORATORIES

JENSEN, WALDEMAR. The Institute for Wood Chemistry at Åbo Akademi; the activities during 1948. Finnish Paper Timber J. 31, no. 7 A: 68-70 (Special issue, April, 1949). [In Swedish; English summary] *cf.* B.I.P.C. 18: 395-6.

The report covers the construction of a new laboratory building, research (chiefly concerned with the chemistry of the bark and wood of birch), new equipment, a branch library, and contacts with other institutions working along similar lines. E.S.

RIDDELL, G. L. P.A.T.R.A.'s future place in the packaging industry. J. Inst. Packaging no. 2: 2-6 (Summer, 1948).

Following a brief summary of PATRA as both a governmental and an industrial agent, a summary is given of its information and advisory services, package-testing, and package-research activities. The most important of these fields is the latter, which includes work on container strength, water-vapor and liquid penetration, gas permeability, and resistance to mold and insects. In addition, work is carried out for the printing industry. R.R.

RESIN, SYNTHETIC

BAKER, M. H. Allyl starch—a new material. Modern Packaging 22, no. 9: 131-3 (May, 1949).

Allyl starch, a new resin developed at the Eastern Regional Research Laboratory, has been introduced to the packaging industry by General Mills Research Laboratories. It is a cream-colored solid, readily soluble in alcohols, ketones, esters, halogenated hydrocarbons, nitroparaffins, high-flash naphthas,

ethers, and aromatic hydrocarbons to which some hydrogen bond-forming solvent—e.g., isobutanol—has been added. It sharpens and brightens colors in lithographic impressions. The cured films form a hard, mar-resistant surface that has a high gloss and is very resistant to solvents, acids, water, and such compounds as oil of wintergreen, mineral oil, and tincture of iodine. Printing inks made with allyl starch as the resin in the ink vehicle dry very quickly, have a high gloss and, when used on cellophane or glassine, show superior adhesions. The starch has a neutral pH, is apparently nontoxic, and can be stored in solvents without gelation. It is incompatible with drying oils and most cellulose derivatives. Its viscosity depends largely on the solvent used, being highest in aromatic hydrocarbons and lowest in alcohols and ketones. Because it tends to contract on polymerization with resultant checking or cracking, films must be plasticized with 10-20% of a plasticizer or plasticizing resin. Optimum properties are obtained when the film is baked at 100-125° C. without driers. Possibilities include its use as a general synthetic coating, specialty lacquer and varnish, a thermosetting adhesive, a printing-ink base, and a paper impregnant for packaging. In connection with the latter use, its ability to "transparentize" paper is of interest. Data are tabulated on its solubilities, compatibility with resins and plasticizing resins, and drying time of solutions. R.R.

SAFETY

EISELLE, D. C. First aid in the woods. Pulp Paper Mag. Can. 50, no. 5: 158, 160, 162 (April, 1949).

The author describes the new system of prevention and first aid gradually introduced into the Kimberly-Clark woodlands division, including physical examinations prior to employment, with definite requirements; first-aid stations in all logging camps; and instruction in first-aid methods for the clerks and supervisory personnel in the camp. E.S.

RITTMAN, M. B. Safety contest pays off. Paper Ind. 31, no. 1: 57 (April, 1949).

The recent successful "Safety Poker" contest is described, which was conducted throughout The Standard Register Co.'s main office and plant at Dayton. Every employee, including the president, participated. This feeling of active participation is considered the strongest possible foundation on which to build a successful program of safety education among employees. The total basic cost of the contest was only $702. E.S.

SEMI-CHEMICAL PULPING PROCESS

PERRY, HENRY J. Neutral sulphite semichemical pulping process. Paper Ind. 31, no. 2: 210-13 (May, 1949).

The two common cooking procedures for hardwoods are discussed—the impregnation process (used for higher grades of bleached pulp) and the shorter board technique, which requires a 7:1 ratio of sodium sulfite to sodium bicarbonate. In the former case the unbleached yield was 69.3%, in the latter 80%. Difficulties in developing a satisfactory chemical recovery process are discussed, as are bleaching and pulp quality. The neutral sulfite chemical processes can yield a bleached aspen pulp which is equal to commercial spruce sulfite in burst and tensile strengths, but not in tear. Of all cooking methods, the neutral sulfite process for hardwoods appears to be the most satisfactory. Capital, wood, and conversion costs are treated very briefly. L.E.W.

SUTHERLAND REFINER CORPORATION. Sutherland Refiner de-

velopments during the past year. Paper Mill News 72, no. 21: 48, 62 (May 21, 1949).

A discussion, supplemented by diagrams, is given of the Sutherland High Yield process, which to date increased kraft pulp yields in board mills by as much as 10%. Even higher yields with kraft pulp are expected in the immediate future, and it is only a question of time before the process will be used in paper and bleached grades. The high yield is accomplished by reducing the percentage of alkali in the cook without changing the penetration and cooking time in the digester. The stock is blown into a blow tank with proper agitation and from there, prior to washing and screening, is pumped to Sutherland refiners with specially designed disks operating at close tolerances to prevent cutting. The pulp from the refiners discharges to washers or storage chests; from this point on, the further treatment is conventional in design. R.R.

SHIPPING CONTAINERS

ANON. Egg billing weights. Fibre Containers 34, no. 4: 28, 30, 35 (April, 1949).

In 1947, the railroads made studies involving wooden and fiberboard egg cases, in which the average weights of the cases were determined. The results showed that the average gross weight of a fiberboard case is 54 pounds and that of a wooden case about 58 pounds. On the basis of these studies, Supplement No. 11 of the Consolidated Freight Classification provided for an increase in the billing weights from the past 53 to 56 pounds, representing a compromise between the weights of the fiberboard and wooden cases. The fiber box manufacturers objected to this discrimination against the fiber case in favor of the wood case, and the Fibre Box Association presented a petition (dated February 14, 1949) to the Interstate Commerce Commission, asking for the establishment of separate billing weights. Excerpts from the petition are reprinted. E.S.

ANON. Rubber containers transporting liquids. Chem. Eng. News 27, no. 20: 1474 (May 16, 1949).

Brief reference is made to a new British shipping container for the conveyance of nonhazardous liquids, consisting of an all-rubber flexible inner envelope which fits neatly into the usual type of collapsible outer box of fiberboard or other material. When empty, the rubber envelope resembles a hexagonal football bladder; when full, it assumes a rectangular shape. The complete package can resist the impact of knocks and dropping to a remarkable extent; the containers have been accepted by the British railways. Mention of rubber as lining or coating in connection with metals for the transport of frozen foods and as insulation is also made. E.S.

ANON. Take-home furniture. Modern Packaging 22, no. 9: 116-17 (May, 1949).

"Pakitan" furniture, light-weight, durable, full-sized, and collapsible, is probably the first in its field to be sold in packaged form. Each item of furniture is sold in an individual, heavy corrugated carton. The packages are closed by stapling the end flaps and have scored fold-back handles on one side to make carrying easier. R.R.

COPSEY, W. N. Solid fibreboard and corrugated containers. J. Inst. Packaging no. 4: 21-3 (Winter, 1948/1949).

Consideration is given to the specifications for materials and sizes of solid fiberboard and corrugated one-piece and wood-frame-end containers as designated by the British Railway Clearing House, and their advantages and limitations. R.R.

COUCH, WILBURN. Economical way to ship glass. Packaging Parade 17, no. 196: 78 (May, 1949).

A shipping container for bus windshields consists of a 350-pound test double-wall corrugated box containing 350-pound test corrugated fillers slotted to fit the curve of the glass and stapled to 500-pound pads. The new container weighs only 67 pounds, 200 pounds less than the wooden crate formerly used, has virtually eliminated damage claims, is easily packed and unpacked, and costs $5, as compared with $20 for the old pack. Illustrations are given. R.R.

GREGGAINS, P. K. W. Continental packaging. J. Inst. Packaging no. 2: 14-20 (Summer, 1948).

The author considers packaging in western Europe using tins and cans, drums, aluminum, cardboard containers, bottles and closures, ampoules, cellophane, paper, paper pails and small packs, paper tape, and sacks and bags. Among the containers and packs described and of interest to the paper industry are a wax-impregnated cardboard cylindrical package with an external paperboard slip cover; a rectangular-sided milk carton with a convolutely wound paper body; a sprinkler-type round container with a paper body and paper or metal bottom; a composite can having a cardboard body lined with aluminum foil, fitted with aluminum ends, and having an interesting method of opening which utilizes a string to cut the scored board and leaves a replaceable plug lid; sufficient ampoule labels, which are printed simultaneously and perforated but left uncut, for a complete box of ampoules —the unseparated labels help to protect the contents of the pack in transit; molded cellulose wadding for packaging glass vials, ampoules, and tablets; and paper tape with a center of narrow fabric, the ends of which are sealed to a package with ordinary gummed tape to form a handle. R.R.

KNIGHT, JOHN W. "Operation NOLA" . . . pattern for unifying military packaging. Am. Boxmaker 38, no. 5: 16-20, 22 (May, 1949).

A report is given of the joint Navy-Air Force seminar held at New Orleans in April. The conclusions reached were that U. S. export packaging is somewhat better than before the war, but has dropped sharply from military requirements. Military needs are being studied to determine what changes can be made in specifications where requirements are proven too rigid. A list is given of the Navy and Air Force reserve officers who participated in the seminar. R.R.

SHIPPING CONTAINERS—FIBER DRUMS

CONTINENTAL CAN COMPANY, INC. *Container Company Division.* Pennsalt adopts new container for cements. Chem. Inds. 64, no. 5: 812 (May, 1949).

Corrosion-resistant synthetic resin-type cement powders are being packaged in fiber drums (Leverpak Drums) coated on the inside with a plastic wax. Polyethylene bag liners (0.002 inch thick) are used for inner containers. The drum, designed to maintain quality through extended storage, is made airtight by means of a lever lock device that clamps the metal top—covered with

polyethylene—to the drum. The containers are used in 15- and 41-gallon sizes. R.R.

SHIPPING CONTAINERS—FROZEN FOODS

ANON. Oyster packaging innovation. Packaging Parade 17, no. 196: 44-5 (May, 1949).

A "Liquid-Film" pouch, which is a transparent, laminated, self-sealing Goodyear Pliofilm bag, is used as an inner container with a rectangular, heavily waxed folding carton for packaging freshly opened oysters in their natural juice. The carton has a die-cut window through which the oysters and also the grade designation printed on the pouch may be seen. The pouches are sealed by machine and put into the cartons by hand. A corrugated display box holds 24 cartons. At present the boxes are overpacked in a wooden container and heavily iced. R.R.

SHIPPING CONTAINERS—PALLETIZING

ANON. Expendable unit load eases customer handling. Packaging Parade 17, no. 196: 77-8 (May, 1949).

"Paper Pack," an expendable unit load being used to ship small machine parts and precision instruments, consists of 200-pound test corrugated boxes, in which individual units are packed, and a four-way expendable wooden pallet. Each layer of filled boxes, which are made without top flaps, is covered by a 3-inch deep cover made of the same board as the containers. Adjacent boxes are spot glued to each other and each layer is glued to the cover below. For customers who cannot move the full pallet load to the assembly line, an adhesive is used which has a high shear but low tensile strength so that the boxes can be separated more easily. A completed pack consists of a maximum of five layers and weighs up to 1580 pounds. Three packs can be stacked for a total static weight of 4000 pounds on the bottom load. Boxes and pallet together weigh 24½ pounds. The Paper Pack has reduced damage claims, cut loading and unloading time—from 2½ hours to 35 minutes on carload shipments—and reduced the tare weight as much as 900%. R.R.

SHIPPING CONTAINERS—TESTING

AMERICAN SOCIETY FOR TESTING MATERIALS. *Committee D-10.* Test for determining penetration of liquids. Shears 67, no. 677: 43 (May, 1949).

The text of the Tentative Method A.S.T.M. Designation D 998-48 T is given for determining the penetration of liquids into submerged finished containers or packages when closed and sealed for shipment. The penetration may be through a sealed closure, seams or joints included in the container structure, or the body of the container. Water is recommended as the liquid except in special cases. The submerging tank, weighing equipment, test specimens, and procedure are described and recommendations are made for reporting the results. R.R.

OSWIN, C. R. The shelf life of pre-packed commodities. Brit. Packer 11, no. 5: 24-5 (May, 1949); *cf.* B.I.P.C. 15: 431.

A formula is given and discussed which expresses the rate of change in the water content of a packed commodity. With its use, the package life of a product can be quickly calculated. It is wise to make exposure trials to verify the calculations; methods of testing are given. Examples of using the formula are presented and recommendations are listed for ensuring high packaging efficiency. R.R.

PORCELAIN ENAMEL INSTITUTE. Safe-Transit program for appliances weighing less than 100 pounds. Shears 67, no. 677: 46, 49 (May, 1949); *cf.* B.I.P.C. 19: 197, 428.

Descriptions are given of two preshipment tests for Project 1A covering packaged products weighing less than 100 pounds: the vibration or vertical shock test and the drop test. For packages weighing between 50 and 100 pounds, the Conbur incline impact test can be substituted for the drop test. After the tests, the product should be free from damage and the container should still be able to give reasonable protection to the contents. When shipments are made from production runs, the complete test cycle should be run daily on enough samples to secure valid results. General approval of industry representatives has been given this part of the Institute's Safe-Transit program. R.R.

SILICATE OF SODA

KREYLING, R. L. Silicate adhesives for corrugated paperboard. Tappi 32, no. 5: 238-40 (May, 1949); Fibre Containers 34, no. 5: 30, 32, 37 (May, 1949).

The historical growth of the paperboard and corrugated industries made many demands upon adhesives. The resulting silicate developments are traced and explained. Analyses and properties of the important silicate adhesives are reviewed. Advantages are also indicated for clay and other mixes. Plant control is stressed, covering both operations and quality. Minimum control methods are suggested and "pass the buck" attitudes are censored. A new, co-operative approach to operating problems is urged. E.S.

SLIME PREVENTION

ANON. New pellets . . . aid slime control. Western Pulp and Paper 2, no. 5: 20-1 (May, 1949).

Sodium pentachlorophenate (Santobrite), one of the most satisfactory chemicals for the control of micro-organic growth, is now available in almost dustless, rapidly dissolving pellets for which the chemical characteristics are given. It is nonvolatile at ordinary temperatures, comparatively odorless, and nonhygroscopic under ordinary atmospheric conditions. Industrial applications include its use for the prevention of pulp-log stain and rot, slime control, the preservation of stored pulp lap, the prevention of felt rot, the preservation of stock and size during shut-downs, the manufacture of mildew-resistant board and coated paper, and the reduction of bacterial count on paper and container board. R.R.

CHAMBERLIN, N. S., and MARTIN, R. B. Control of slime in groundwood mills. Tappi 32, no. 5: 215-20 (May, 1949).

The causes and effects of slime development are discussed in particular reference to groundwood-mill operation, with some comparisons made with other types of pulps and papers. Common sources of slime infection are reviewed, along with the usual methods for determining the importance of the source of infection and the necessary corrective treatments. Particular reference is made to the use of break-point chlorination in the preparation of an ideal mill fresh-water supply, and the resulting influence on quality of finished groundwood papers, such as those used for food packaging. Some attention is paid to the physical arrangement or mechanical details of the groundwood system and the plea is made for the correction of faulty construction in an effort to minimize product and quality losses. Recirculated

white-water systems are discussed, and the merits of the various bactericidal and fungicidal treatments are considered in keeping with the use requirements of the finished product. E.S.

SCOTT, WILLIAM W. Slime control with Pyridose. Paper Mill News 72, no. 21: 60 (May 21, 1949).

Following a brief discussion of slime formation, the author considers its prevention, in particular the use of Pyridose (pyridylmercuric acetate); pyridylmercuric chloride is mentioned for slightly alkaline mill waters. R.R.

STARCH

MINDELL, FLORENCE M., AGNEW, A. LOUISE, and CALDWELL, M. L. Further studies of the action of pancreatic amylase; hydrolysis of waxy maize starch. J. Am. Chem. Soc. 71, no. 5: 1779-81 (May, 1949).

A study has been made of the hydrolysis of the branched chain substrate, waxy maize starch, by highly purified maltase-free pancreatic amylase. It has been found that the extent of the hydrolysis of waxy maize starch, like that of other starches and of their linear components, depends within wide limits upon the concentration of pancreatic amylase. Under comparable conditions and judged by the total reducing values of the reaction mixtures, waxy maize starch is hydrolyzed more slowly by pancreatic amylase than unfractionated cornstarch and much more slowly than the linear fraction from cornstarch. Maltose is present in significant concentrations from the very early stages of the hydrolysis of waxy maize starch by purified pancreatic amylase. Glucose, also, is liberated in the hydrolysis of waxy maize starch by purified maltase-free pancreatic amylase but this sugar is set free in smaller concentrations than maltose and does not appear in the very early stages of the hydrolysis. Waxy maize starch is hydrolyzed rapidly by pancreatic amylase to products of relatively low average molecular weights and of relatively high reducing values. The attack of pancreatic amylase on waxy maize starch appears to be random in the early stages of the hydrolysis but the accumulation of low molecular weight products in the later stages of the hydrolysis indicates that the action of the amylase is not perfectly random. 25 footnotes. E.S.

MONTGOMERY, EDNA M., WEAKLEY, F. B., and HILBERT, G. E. Isolation of 6-[α-D-glucopyranosyl]-D-glucose (isomaltose) from enzymic hydrolyzates of starch. J. Am. Chem. Soc. 71, no. 5: 1682-7 (May, 1949).

Waxy cornstarch was exhaustively hydrolyzed with enzymes and the fermentable sugars removed by fermentation. A disaccharide, apparently the anomalous unit, was isolated from the unfermentable residue in the form of three crystalline derivatives, which were shown to be interconvertible. The structure of the disaccharide was proved to be 6-[α-D-glucopyranosyl]-D-glucose through its octaacetyl derivative, which is identical with octaacetyl-6-[α-D-glucopyranosyl]-β-D-glucose isolated from dextran hydrolyzates and identified by periodate analyses of the methyl glycoside of the disaccharide. In a second similar experiment the hydrolyzate was not fermented. The principal products, D-glucose and isomaltose, were separated by sorption and desorption on carbon-Celite columns. The preparative procedure for 6-[α-D-glucopyranosyl]-D-glucose from starch has been simplified. The new disaccharide has been isolated for the first time as a crystalline substance. 18 footnotes. E.S.

STATISTICAL METHODS

CLARKE, BEVERLY L. Statistical methods in the chemical industry. Chem. Eng. News 27, no. 20: 1426-8 (May 16, 1949).

The application of statistical methods to chemistry is far behind their use in other types of industry. The author reviews briefly some of the tools which the statistician has available and which are applicable to the problems of the chemical industry. A few examples are given of the kind of service which present-day statistical science can render, one experience being taken from the chemical side of an electrical industry and the other from the chemical industry. E.S.

STEAM POWER

BLASWEILER, TH. E. The "BDG-steam motor," a solution of the fuel problem in the German motor-truck traffic. Wochbl. Papierfabr. 77, no. 3: 69-72 (March, 1949). [In German]

A description of the new steam motor (not to be confused with the regular steam engine) is given, which was developed by Hellmuth Butenuth for German motor trucks, utilizing coal as fuel. Measurements have shown that fuel consumption by trucks for 8-10 tons/100 km. in hilly country amounts to Mark 17.3 for gasoline, 9.6 for the Diesel engine, 6-7 for wood generators, and 2.1 for the BDG-steam motor heated with coal. 5 illustrations. E.S.

LASSBERG, v. Fuel and heat prices. Wochbl. Papierfabr. 77, no. 4: 99 (April, 1949). [In German]

The price of fuel plays an important role in the present heat and power economy. The price of fuel/kg., on the other hand, does not offer a comparable basis, because the calorific power must also be taken into consideration. The author presents tabulated data of heat prices (based on 100,000 kcal. in the fuel) in different countries, listing the price of fuel (wood, coal, oil, and gas)/ton, the heating value in kcal./kg., the price of heat in the exchange of the country, and the price converted to dollars. Hydraulic power is another important factor; in countries with high fuel costs, hydroelectric power may be cheaper. This justifies the installation of electric boilers in Sweden and Switzerland and the extensive use of heat pumps in the latter country. A diagram from a Swedish source is reproduced showing the price of the kwh. in that country, produced by hydroelectric and steam power and the advantages of a noncondensing over a condensing operation, the former still being able to compete with water power. The financial benefits to be derived from long operating hours are also indicated by the curves. The 24-hour operation in pulp and paper mills results in cheaper rates through the possibility of utilizing excess and night power. E.S.

SIMPSON, A. D. Macon Kraft power plant and water system. Paper Trade J. 128, no. 21: 19-21 (May 26, 1949).

Three General Electric Co. turbo-generating units and Westinghouse metal-clad switch gear equipped with air breakers are part of the equipment at the new Macon Kraft Co. mill. The boiler plant has two 150,000-pound pulverized coal-fired boilers and one 100,000-pound bark-fired unit, all of the V-U type, built and erected by Combustion Engineering Corp. The coal-fired boilers have shown a performance as high as 86.2% efficiency under normal conditions during tests. The Raymond pulverizers are designed for coal of low grindability. The average daily coal consumption is 230 tons (heat value of the coal is 13,300 b.t.u./lb.). The bark-burning boiler is equipped with a Hofft furnace with three 6.5-foot cells, the first of this design to be operated. The

average steam generation is 160,000 pounds daily, or 2650 pounds of steam from the bark per ton of board. The average steam demand is 10,600,000 pounds, of which the recovery boilers supply 4,500,000, the bark boiler 1,600,000, and the coal boilers 4,500,000 pounds. The Worthington boiler feed water-treatment plant is a 220,000 lb./hr. hot-process water softener with phosphate treatment. A Diesel generator unit is available for auxiliary power. Mill water is taken from the Ocmulgee River by three Layne Atlantic vertical centrifugal pumps, each with a 5000 gal./min. capacity. The Dorr water-treatment plant has a storage capacity of 3,000,000 gallons of treated water, chiefly for fire protection. The average daily consumption of raw water is 15,000,000 gallons. R.R.

SULFATE MILLS

ANON. Sorg completes first stage of large improvement programme. Western Pulp and Paper 2, no. 5: 6-9 (May, 1949).

Photographs and brief explanations are given showing the improvements at the Port Mellon, B.C., mill of the Sorg Pulp Co. Among the changes already made and proposed are an improved chemical recovery plant, a new power house, a two-stage Swenson Nyman washer, five Trimby screens, four stationary digesters, and hydraulic slab-barking equipment. Improvements have also been made in the town itself. R.R.

SULFUR DIOXIDE

CONRAD, FRANK H., and BRICE, DONAT B. The solubility of sulphur dioxide in magnesium bisulphite solutions. Tappi 32, no. 5: 222-6 (May, 1949).

The Duhring relation was applied to a 3-phase, 3-component system for the determination of the solubility of the combined sulfur dioxide (I). The experimental data at 15 and 25° C. were extrapolated for 5, 35, 50, and 60° C. and single solubility determinations at 35° C. added greatly to the reliability of the work. Pressure composition curves are presented in terms of combined and total (I) for temperatures ranging from 5 to 60° C. Comparison with data of other workers for the unsaturated region where only liquid and gas phases are present indicates that p-t-z diagrams $[p-p_s = k(t - 1.95z)]$ where $p =$ (I) pressure above solution, $p_s =$ (I) pressure above a saturated solution, $t =$ total (I) per 100 grams water, $z =$ grams combined (I) as in magnesium sulfite per 100 grams water, will describe the system magnesium oxide-sulfur dioxide-water for the range of 5 to 60° C. and total pressure to one atmosphere. E.S.

WHITNEY, ROY P., and VIVIAN, J. E. Absorption of sulfur dioxide in water. Chem. Eng. Progress 45, no. 5: 323-37 (May, 1949).

Experimental results are presented on the absorption of sulfur dioxide in water in a tower 8 inches in diameter and packed to a height of 2 feet with one-inch ceramic rings. The liquor rate was varied from approximately 900 to 12,000 lb./hr./sq. ft., the gas rate from approximately 65 to 850 lb./hr./sq. ft., and the temperature from 50-90° F. Over-all coefficients for sulfur dioxide absorption show all the characteristics of a system where both film resistances exert an appreciable effect. They increase markedly with increasing liquor rate, gas rate, and temperature. To help in considering the results, the over-all coefficients are broken down into values for the two film coefficients. This analysis is carried out with the help of certain assumptions based upon previous absorption studies (*cf.* B.I.P.C. 18: 361-2). It is shown that at

70° F., $k_La = 0.044L^{0.82}$ and $k_Ga = 0.028G^{0.7}L^{0.25}$. Results obtained at other temperatures correlate well with the predicted effect of temperature upon the two film coefficients (and the known effect upon the solubility relationship). Further consideration of the liquid film coefficients lends credence to the concept, previously expressed for the chlorine-water system, that the rate of hydrolysis of sulfur dioxide within the liquid film may be inconsequential with respect to the rate of absorption. Pseudoliquid film coefficients, recalculated on the basis of the undissociated sulfur dioxide driving force, are in excellent agreement with coefficients predicted for this system from oxygen data and the liquid film correlation of Sherwood and Holloway. It is concluded that the over-all coefficients as presented are reliable for use in design under the conditions for which they were determined. 5 tables, 14 figures, 24 references. R.R.

TALL OIL

ENKVIST, TERJE, and MÄKELÄ, KEIJO. Lubricating oil from pine tar and tall oil. II. The effect of catalysts on the decarboxylation of resin acids from tall oil and tall oil pitch. Finska Kemistsamfundets Medd. 57, no. 1-2: 21-61 (1948). [In English] *cf.* B.I.P.C. 18: 523.

When the resin-acid mixture from tall oil or pine tar, or the crude and refined tall oils and tall oil pitch were heated with suitable catalysts at 300-310° C., the resin acids underwent decarboxylation. Fuller's earth, as well as an inorganic impurity in the resin acids, appears to have a marked decarboxylating effect (despite their insolubility in the reaction mixtures). Sodium hydroxide acts as an inhibitor of the decarboxylation. Iron chlorides and nitrates and nickel chloride, nitrate, and acetate catalyze decarboxylation. Other possible catalysts which were studied included iron and nickel resinates and carbonates, powdered iron, nickel metals (which were very feeble), and nickel and iron hydroxides, sulfates, formates, phosphates, and oxalates (which were practically inactive). Iron chlorides yield carbon dioxide and carbon monoxide and a mixture of abietene and abietine (and other high boiling products). Nickel acetate gives largely carbon monoxide and abietine, with appreciable amounts of hydrogen and methane. Nickel acetate appears to be activated by betaine and alanine. Zinc and manganese chlorides are also active catalysts. Various catalyst-inhibitors are discussed. Other active catalysts are sulfuric acid, tungstic and phosphotungstic acids, *p*-toluenesulfonic and cymenesulfonic acids, Naphthol yellow S, and camphorsulfonic acids; but some related compounds (like 1,4-naphtholsulfonic acid) are practically inactive. Sometimes a specific isomer (like metanilic acid) is very active whereas the other isomers are inactive. Evidently dehydroabietic acid decarboxylates more slowly than do other resin acids and, therefore, it is found among the products of partial decarboxylation of tall oil. The results of this very extensive work are given in 18 tables. 42 references. L.E.W.

ENKVIST, TERJE, TIMONEN, ERKKI, JORMALAINEN, AULIS, and AARNIO, OLAVI. Lubricating oil from pine tar and tall oil. 3. The effect of catalysts on the decarboxylation of fatty acids from tall oil. Finnish Paper Timber J. 30, no. 24: 446-52, 459 (December 31, 1948). [In English]

Ordinarily the same catalysts which serve to decarboxylate the resin acids cause decarboxylation of tall oil fatty acids, but usually at temperatures about 30° higher than those required for the resins. Nickel and iron salts of resin and fatty acids are especially good catalysts. When metallic iron is

used, however, the fatty acids evolve carbon dioxide and give rise to ketones such as oleone, stearone, and palmitone, whereas nickel acetate gives largely carbon monoxide and comparatively volatile reaction products (probably containing hydrocarbons). Ferrous chloride and nickel resinate also give rise to carbon monoxide. (For part 4, *cf.* B.I.P.C. 19: 553-4). 9 tables and 23 references. L.E.W.

JAKOBSON, TORSTEN. Tall oil or liquid rosin; a review of the literature. Svensk Papperstidn. 52, no. 8: 193-8 (April 30, 1949). [In German] *cf.* B.I.P.C. 15: 263.

Continuing his previous review, the author adds 68 further abstracts of patents, periodical articles, etc. (nos. 379-446) to his bibliography. The references cover material published in the period from 1939 to 1945 inclusive. E.S.

PATRICK, T. M., JR., and EMERSON, WILLIAM S. Unsaturated long-chain aliphatic esters; catalytic oxidation. Ind. Eng. Chem. 41, no. 3: 636-41 (March, 1949).

The liquid-phase air oxidation of the methyl esters of unsaturated fatty acids from tall oil (MEUFA) is described. In order to develop a technique for the method, the oxidation of ethyl oleate and of oleic acid was studied in some detail. Oxidative scission was expected to take place at or near the double bonds to yield mono- and dicarboxylic acids. Large amounts of high molecular weight by-products, in addition to the expected scission products, were formed in these oxidations. The identified products comprised most of the members of the homologous series from caproic to palmitic acid and from suberic to undecanedioic acid, inclusive. 27 references. E.S.

TANNING

GUSTAVSON, K. H. The effect of drying vegetable tanned hide powder on its reaction with chromic salts and acids. J. Am. Leather Chem. Assoc. 44, no. 5: 321-6 (May, 1949).

Although drying of wattle-tanned hide powder has pratically no effect on its hydrochloric acid binding capacity, air drying reduces its ability to fix chromium salts. Heating the tanned powder for three hours at 100° C. reduces the chrome fixation still further. The effect is greatest with the higher molecular weight complexes. Experiments were also made with α-lignosulfonic acid as an example of a high molecular weight reactant. The irreversible fixations of the α-lignosulfonic acid were: blank hide powder, 40.7%; wattle-tanned hide powder, undried, 27.7%; and wattle-tanned hide powder, dried at 100° C., 4.6%. M.A.B.

TEXTILE INDUSTRY AND FABRICS—ROTPROOFING

BAYLEY, C. H., and WEATHERBURN, MURIEL W. The weathering characteristics and rot resistance of cotton duck treated with the copper complex of nitrosophenylhydroxylamine. Can. J. Research 27 F, no. 3: 112-18 (March, 1949).

Unbleached cotton tentage duck, treated with the copper and copper-iron complexes of nitrosophenylhydroxylamine, showed considerable resistance to rotting in soil burial tests but gave evidence of enhanced actinic degradation and loss of treating compound as a result of outdoor weathering for three months during the summer. With samples containing a higher concentration of the complexes this degradation was more severe. E.S.

TRANSPARENT CONTAINERS

HUNT PARTNERS LIMITED. The Phantom Pack. Brit. Packer 11, no. 5: 32 (May, 1949).

The Phantom Pack is made by drawing or forming sheet plastic by a special molding process adaptable to almost any shape and size of product. Containers, displays, and small plastic parts for cars have been successfully made by the process, although it is not suitable for rectangular or square shapes with sharp corners. The tools necessary for each job are inexpensive. Cellulose acetate (0.02 inch) has been molded to a depth of 4½ inches with a 4-inch diameter. The American licensers are Borkland Laboratories. R.R.

WASTE LIQUOR

ANON. The chemical news parade: By-products recovered from wood chip explosion. Chem. Eng. News 27, no. 21: 1534-5 (May 23, 1949).

With reference to the recently opened chemical products recovery plant of the Masonite Corp. at Laurel, Miss., a very brief illustrated description is given of the manufacture of two of these products. One material is a very fine, highly lignified hydrolyzed lignocellulose finding use in the foundry, plastic, and rubber industries. The other is a water-soluble hemicellulose extract recovered either as a viscous brown liquid or as a spray-dried powder. The solution is in general use as a binder for bituminous coal or moisture-resistant foundry cores, as low-cost sugar for chrome tanning leather and fermentation processes, etc. Both the liquid and the solid are being used as extenders for natural and synthetic glues and adhesives. E.S.

EDLING, G. Thermotechnical problems in chemical pulp mills. Norsk Skogind. 3, no. 3: 61-71 (March, 1949). [In Swedish; English summary]

In the first section of the article, recent spray-type recovery units in Scandinavian sulfate mills are described, supplemented by diagrams. Mention is made of the older and recent Tomlinson systems; the units constructed by Jönköpings Mekaniska Werkstad (JMW) and that developed jointly by Combustion Engineering and Svenska Maskinverken (CE-LM) are discussed in more detail. The most outstanding difference between American and Scandinavian systems, apart from capacity, is the fact that the Scandinavian units are always equipped with an economizer and an air preheater for cooling the flow gases to a low temperature, whereas in America the gases are very often used for evaporating the black liquor in disk evaporators. The difference in these principles and their effect upon the heat economy are illustrated in a graph. All Swedish spray-type units are equipped with electrofilters for recovering sulfate from the flue gases; they usually operate with 95-98% efficiency. The influence of the dewpoint of the flue gases for avoiding sulfur trioxide formation is mentioned. A modern sulfate mill equipped with a spray-type unit should be able to cover its entire fuel demand without recourse to coal or oil. All Scandinavian efforts are directed toward this goal, which is of lesser importance in the United States and Canada. Problems of heat consumption in sulfate mills are finally discussed, with particular reference to digesters and evaporators. In the second part of the article, the evaporation and combustion of sulfite waste liquor receive consideration. The systems of Ramén and Rosenblad are outlined briefly. Two tables illustrate what saving in fuel can be obtained and justified economically under certain conditions in a mill making strong sulfite and dissolving pulp. Making unbleached sulfite pulp, for instance, at a coal price of Sw. crowns 60.00/ton, a saving in fuel

can be realized, amounting to 350 kg. coal/ton of pulp, when noncondensing evaporation, and 240 kg. when vacuum operation in five stages is employed. In a rayon pulp mill, the corresponding savings are 500 and 340 kg. coal, respectively, per ton of pulp. Certain difficulties connected with the combustion of liquor in the form of dry powder are mentioned. According to Swedish experience, it is better to burn heavy liquor than dry powder with regard to deposits forming on the heating surfaces. The problems connected with high ash and sulfur dioxide content of the flue gases have not yet been solved quite satisfactorily. Methods for the simultaneous destruction of both are now under investigation in Sweden. E.S.

WAXES

SOCONY-VACUUM OIL COMPANY, INC. Socony-Vacuum announces new microcrystalline waxes. Am. Paper Converter 23, no. 5: 9, 18 (May, 1949).

S/V Magnowaxes, now commercially available in two color grades, amber and brown, are more flexible, tough, and adhesive, and act better at low temperatures than do the conventional microcrystalline waxes. They are especially useful in frozen-food packaging and laminations. The new waxes are produced conventionally, with additional operations designed to remove paraffin-type waxes. Even high-quality conventional microcrystalline waxes, such as S/V Product 2305, lose flexibility at 30° F.; S/V Magnowaxes are still flexible at 15° F. under the same conditions. The new product is somewhat more viscous when molten than the older type and may require adjustments in application. With no other changes, a temperature rise of 15-20° F. above that used with the conventional waxes will hold the amount applied at the proper levels. However, in many cases an equal degree of control can be obtained by adjustments in doctor blades, the position of the coating roll, and the operation speed. A comparison of test results obtained with S/V Magnowaxes Amber and S/V Product 2305 shows that the new product has approximately twice the laminating strength of the older type used in the same amounts. Typical data obtained at 70° F. are tabulated. S/V Magnowaxes are available in tank cars and in 400-pound metal or fiberboard drums. R.R.

WOOD

RONGE, E. W. So-called inferior wood; comments on its utilization and floating. Norsk Skogind. 3, no. 4: 87-95 (April, 1949). [In Swedish; English summary]

The conversion of wood begins actually in the forest, which can be considered the first department of the forest industry. The requirements of the pulp industry with regard to quality and diameter of the pulpwood underwent considerable changes during the last decades. In recent years, the industry was compelled to use inferior wood as raw material; in spite of it, no deterioration in quality of pulp resulted. There are extensive stands of small-diameter pulpwood in Norwegian as well as Swedish forests. Reducing the permissible minimum diameter to 2½ inches top measure would increase the available pulpwood supply, as well as the possibilities of forest cultivation. The necessary manpower and logging costs are higher for the small-diameter wood; quality, on the other hand, is not adversely affected. Investigations on decayed pulpwood have shown that some of this type of wood, previously left behind in the forest, can be included without risk of quality deterioration. Pulping of deciduous species (which amount to approximately one seventh of the total timber supply) has recently come to the fore. Birch with a 30% higher density than conifers presents a flotation problem, which may

possibly be overcome by allowing the felled trees to season in the forest without removal of foliage or by end impregnation of the unbarked trunks. Birch may assume importance as a raw material for dissolving pulp. If the specifications for pulpwood would be lowered to the extent that the supply of manpower and increased logging cost will allow, the present and future industry would benefit by this move. E.S.

STAMM, ALFRED J. Passage of materials through wood, paper, cellulosic membranes, and fabrics. Tappi 32, no. 5: 193-9; discussion: 199-203 (May, 1949).

The author reviews the subject under the subheadings: pressure permeability, overcoming surface tension, capillary rise, capillary condensation, ultrafiltration, and diffusion. 44 references. E.S.

TARKOW, H. The swelling and shrinking of wood, paper, and cotton textiles and their control. Tappi 32, no. 5: 203-11 (May, 1949); *cf.* B.I.P.C. 19: 592-3.

The author reviews the subject under the headings: sorption phenomena; swelling and moisture gain; swelling of wood, fabrics, and paper; and dimension stabilization of wood by resin, formaldehyde, and heat treatment. The part played by the outer and inner windings of the fiber in hygroexpansivity is pointed out. Data are submitted in support of the theory that dimensional stability or resistance to shrinkage is obtained by the inclusion of a certain proportion of inert material (about 30%) in wood. When this is accomplished by ester formation, the same volume of a higher molecular weight material, such as the butyryl groups, is as effective as the lower molecular weight acetyl group, even though it does not replace as many cellulosic hydroxyl groups. Cross linkages formed by treating wood with formaldehyde vapor give dimensional stability at low formaldehyde consumption but, unfortunately, the experimental conditions also severely degrade the wood. Heat treatment as a means of stabilizing dimensions or as a means of reducing the hygroexpansivity of cellulosic materials has distinct limitations. 15 references. E.S.

WOOD—CHEMISTRY

JENSEN, WALDEMAR. The chemical composition of wood of white birch. Finnish Paper Timber J. 31, no. 7 A: 20-6 (Special issue, April, 1949). [In English]

A thorough study was made of the chemical composition of a sample of white birch (*Betula verrucosa*) felled in February, 1948. The following data were obtained: cellulose 38%, xylan 22.9%, mannan 2%, levulan 1%, glucan 0.5%, galactan 0%, araban (probably absent), polyuronide 5.9%, lignin 19.6%, acetyl 4.4%, formyl 0.2%, ether extractives 2.7%, protein 1%, ash 0.3%, not accounted for 1.5%. After a sulfite digestion, a 57.4% pulp yield was obtained. The pulp contained 66.1% "cellulose" (corrected for other carbohydrates and given by difference from 100), 26% xylan, 2.6% mannan, 1.7% levulan, 2.2% lignin, and 1.4% ash. The author divides the hemicelluloses into two classes: those of the "cellulose type" and those which are "easily hydrolyzable." The former comprise 17.4%, and the latter 14.9% of the wood. Methods for determining the various components are given in great detail. The analyses of birch are compared with previous comprehensive analyses of spruce (*Picea excelsa*) and Scotch pine (*Pinus sylvestris*) made by other investigators. 24 references. L.E.W.

WOOD—DECAY

BUCKLAND, D. C. The control of decay in mature timber. Western Pulp and Paper 2, no. 5: 23-5 (May, 1949).

Because of decay, standing mature timber in western Canada has lost 6 to 28% of its merchantable volume, depending on the species and region. Control of decay in the mature forest is needed through the reduction of financial loss to an absolute minimum by the utilization of mature and overmature timber. Timber that decays as fast as or faster than it grows should be cut to stop the waste of good wood-producing soil. A pathological survey can and often should be carried out in conjunction with the basic classification of forest land; this would involve little extra trouble. With the results of such a survey, the period of maximum net growth can be computed for the region. Maximum utilization is the second phase of decay control in old timber. Many old trees with a series of conks on the bole actually contain much sound wood. Investigations should be made on the utilization of wood affected by brown rot, which attacks mainly the cellulose, and white rot, which affects chiefly the lignin. The sale of what is used and the satisfaction of the customer must be assured. R.R.

WOOD—MENSURATION

MULLOY, G. A. Calculation of stand density index for mixed and two-aged stands. Pulp Paper Mag. Can. 50, no. 5: 168 (April, 1949); *cf.* B.I.P.C. 14: 263-4.

The stand-density index described in the previous reference does not seem to be applicable to truly uneven-aged forests. The method of calculating the stand-density index for mixed and two-aged stands is illustrated by an example. E.S.

THOMSON, C. C. Reduction of error in line-plot tally. Pulp Paper Mag. Can. 50, no. 5: 163 (April, 1949).

The author describes how an increase in accuracy of tree tally made by university student-assistants in 1947 was obtained by taking check tallies on a number of plots, analyzing the data in an effort to determine the most frequent causes of errors, and pointing out these errors to the next field party of student-assistants trained in 1948. Tabulated check-tally data for 1947 and three months of 1948 show the encouraging improvement in accuracy. E.S.

WOOD OPERATIONS

HODGINS, H. J. Wood procurement and utilization. Paper Trade J. 128, no. 16: 24-6; no. 19: 19-20 (April 21, May 12, 1949).

Writing of British Columbia, the author states that it was only about 100 years ago, with the establishment of sawmills, that the first coastal industry began to grow in earnest. During the early 1900's, the development of the pulp and paper industry commenced. While the people of the Province used the forests to further the development of that region, the forest industry grew, until recent years, without seriously considering its future. In the future, wood procurement and utilization will be correlated with long-range forest-management objectives. A general history is given of logging, from early primitive methods, through the introduction of steam, and to the present stage of fast powerful gas, Diesel, and electric equipment. With these changes have come greater utilization of forest products. The industry is now adding new species, sizes, and qualities to its list of desirable timber. The

importance to the industry of wood density is emphasized. Improved logging practices, resulting in good clean jobs, create a condition more favorable for fire protection and seed-bed purposes and less favorable for insect breeding. The present trend toward reducing wood losses will continue as long as it results in more economic wood. In the processing plant, good wood utilization necessitates the blending of various qualities and species and the special selection of logs for certain paper grades; the use of recently developed equipment, such as hydraulic barkers and whole-log chippers; and the use of sawmill slabs where available. R.R.

SIMMONS, FRED C. Logging for profits. Wood 4, no. 5: 26, 46-7 (May, 1949).

Small, poorly financed logging operations, rugged topography, and light stands, all prevalent in the Northeastern and Lake states, make mechanization essential for profitable logging. Descriptions and some illustrations are given of new developments in chain saws, small logging arches, winches and booms mounted on tractors, cable systems, portable circular slasher plants, crane units, and self-loading trucks. One of the greatest needs is for a really efficient debarker which would eliminate transporting bark to the mill. The development of logging equipment for the farmer-logger is a real challenge, to which one answer is accessories for farm equipment. Training men and the proper scheduling of work to keep equipment busy are important in mechanized logging, and proper maintenance is essential. 5 illustrations. R.R.

SIMMONS, FRED C. Mechanized logging. Report 8th Vermont Wood Products Conference: 22-5 + 2 plates (1948).

This is essentially the same article as the preceding reference. 10 illustrations. E.S.

WOOD ROOM

ANON. Bathurst's ingenious new plant: wood merry-go-round. Pulp & Paper 23, no. 6: 30-4 (May, 1949).

Supplemented by a flow diagram and a number of illustrations, the unusual arrangement of the wood yard and wood-handling facilities at the Bathurst mill of the Bathurst Power & Paper Co., Ltd. are described. The company operates a kraft, sulfite, and groundwood mill and makes 425-450 tons of products daily, of which 80 tons are market sulfite pulp and the rest paper and board products. The wood is floated to the mill and carried by underwater propeller agitation to the jackladders, from which it is dumped in four-foot lengths on a chain conveyor, which carries it to the barking plant. Above three drum barkers, two inside and one outside the new plant, are two revolving circular steel sorting tables. The wood from the barkers passes over these tables which are operated by one man in the central electrical control turret on top of the tables. Three men stationed in monitors next to the upper sorting table direct the cleaned wood to the sulfite, kraft, or groundwood mills, or back to the barkers (if not sufficiently cleaned). Wood brought in by cars is dumped to the lower turntable and fed to the barkers directly, or to conveyors carrying it to the storage piles. It takes only six men per shift to operate the entire wood-barking and conveying set-up, where previously 22 men per shift were needed. The waste bark from the drum vats is pressed in cylindrical bark screens and dumped on conveyors carrying it to bark bins; from there it is loaded on to trucks and at present used as a fill for a new park area. E.S.

WOOD TRANSPORTATION

McCOLL, B. J. The trends of truck hauling costs. Pulp Paper Mag. Can. 50, no. 5: 136, 138-40, 142-4 (April, 1949).

The total cost of transporting pulpwood by truck on limits in Eastern Canada is made up of three dependent cost factors: vehicle costs, road costs, and loading and unloading costs. An analysis of the variables involved in vehicle cost is presented, supplemented by numerous tables and diagrams. The results indicate the possibility of an approximate 60% reduction in cost when hauling pulpwood with the heaviest trucks, as compared with the lightest trucks on any similar yearly mileage operation. Further, increasing yearly mileage from 10,000 to 20,000 miles per year can decrease hauling costs by more than 30%, regardless of vehicle size. Considerably more attention should be given to this last factor as a possible yardstick by which to measure the over-all efficiency of a truck-hauling operation. E.S.

X-RAY RESEARCH

HERMANS, P. H. Degree of lateral order in various rayons as deduced from x-ray measurements. J. Polymer Sci. 4, no. 2: 145-51 (April, 1949).

X-ray measurements on 16 different specimens of regenerated cellulose reveal that there exists a pronounced negative correlation between the integrated intensity of the 101 interference and its half-width. The 101 plane is a preferred cleavage plane and represents the lamellar plane of the ribbon-shaped crystallites. Variations in the intensity of the other interferences are much less or nonexistent. These results show that the degree and the perfection of lateral order according to the $10\bar{1}$ and 002 planes are little at variance, but that order according to the 101 plane is extremely variable in such a way that, if the average thickness and (or) perfection of the lamellas increases, the total number of well-ordered 101 plane contacts diminishes. As a possible explanation of this phenomenon, it is suggested that various degrees of recrystallization with reference to this particular plane (i.e., various degrees of lateral order) may be associated with the various rayon specimens. This, however, does not necessarily imply differences in the total amount of ordered substance. This explanation is corroborated by the fact that cellulose acetate fibers, which were previously allowed to "recrystallize" by heating in methanol, yield after saponification a rayon with a particularly sharp, but also particularly weak, 101 interference, without exhibiting a higher total percentage of ordered substance than the saponification products of acetate treated in this manner. E.S.

HERMANS, P. H., and WEIDINGER, A. X-ray studies on the crystallinity of cellulose. J. Polymer Sci. 4, no. 2: 135-44 (April, 1949).

The method for the evaluation of the percentage crystallinity in cellulose preparations from x-ray intensity measurements, previously described in detail (*cf.* B.I.P.C. 18:719-20), is reviewed briefly and new material presented consisting of crystallinity percentages between 8% and 70%. Cotton, flax, and ramie possess equal crystallinity (70%) and so do the majority of rayons, independent of their degree of orientation and including cuprammonium and Lilienfeld rayons. Cellulose acetates saponified under varying conditions also yield almost the same value as rayon (40%). The new product Fiber G (du Pont) holds an exceptional position with 53% crystalline substance. In the series of native celluloses, wood pulp has about 65%, Valonia 65-70%, and bacterial cellulose about 40%. By dry grinding of rayon, a powder was

obtained containing only slightly less than 10% crystalline substance which, on recrystallization from water, yields a product having the same crystallinity as rayon. The difference between the heats of wetting of the original and the recrystallized powder affords additional support of the results obtained.
E.S.

HEYN, A. N. J. Small-angle x-ray scattering in various cellulose fibers and its relation to the micellar structure. Textile Research J. 19, no. 3: 163-72 (March, 1949).

The study of the molecular structure of cellulose fibers by x-rays has been concerned until very recently with diffraction of only relatively wide angles. Almost no work has been done on the diffraction and scattering of x-rays within very small angles adjacent to the primary beam. The only fact known was that such "small-angle scattering" is produced by ramie and viscose rayon. In the present study, the small-angle scattering by various cellulose fibers has been investigated and it has been found that the scattering by different fibers is completely different. The hypothesis that the small-angle scattering in cellulose fibers may be related to the micellar size and distance is substantiated by the fact that an experimental change of those distances results in a corresponding (inverse) change in the extent of the scattering. On this basis the difference in the scattering patterns of different fibers is explained as a difference in the size and distance of the cellulose micelles or crystallites. An orientation of crystallites is also expressed in the small-angle diffraction pattern giving rise to the interesting phenomenon of "cross" formation when the crystallites form an angle with the long axis of the fiber. The angle between the intersecting lines of the cross proved to be related to the pitch of the spiral of the crystallites in the fiber. 30 references.
E.S.

HEYN, A. N. J. Small-angle x-ray scattering of various cellulose fibers. Small-angle scattering of x-rays and the micellar structure in cellulose fibers. J. Am. Chem. Soc. 70, no. 9: 3138-9 (September, 1948); 71, no. 5: 1873-5 (May, 1949).

The author shows in the first part that different cellulose fibers produce different x-ray small-angle scattering diagrams and ascribes this phenomenon to differences in micellar distances, assuming that the scattering elements can be identified with the crystalline domains or micelles. By studying the changes in the intermicellar distances of cellulose fibers, produced experimentally, on the small-angle pattern, experimental proof of this relationship is offered in the second part. Swelling in water, potassium hydroxide, or cuprammonium solution brought about a decrease in length of the pattern lines. The deposition of crystals (gold, sodium chloride, or saccharose) in the fibers resulted in a shortening and decreasing width of the scattering lines. It is pointed out that the arrangement of the micelles rather than their size determines the scattering, and the implications with regard to determining particle size and distances between particles are mentioned. 17 references.
M.A.H.

Patent Section

Although the abstracts of the United States patents are prepared from the patents themselves, the initial selection of the patents to be abstracted is made from the Patent Gazette *and, therefore, it is possible that the patent section will not contain all patents of potential interest to the industry. The abstracts of the Canadian patents are prepared from the claims published in the* Canadian Patent Office Record. *In so far as possible, an attempt will be made to indicate patents issued in both countries.*

The patent abstracts are listed under the various headings currently used for the abstracts of periodical articles.

Printed copies of United States patents can be obtained from the Commissioner of Patents, Washington, D.C.; the price is 25 cents per copy. Canadian patents are available only as manuscript or photostatic copies. They are furnished by the Commissioner of Patents, Ottawa, Canada. An estimate of the cost of a patent should be obtained in advance of the order.

ABRASIVES

WILLIAMSON, JOHN A. Abrasive web material. U. S. patent 2,468,853. Filed Sept. 15, 1944. Issued May 3, 1949. 11 claims. Assigned to The Carborundum Company.

A method of making flexible fibrous abrasive webs consists in forming a thin aqueous suspension of fibrous material, depositing the fibers on a foraminous support as a highly aqueous web, introducing a sufficient quantity of abrasive particles and an adhesive binder into the interior of the web, removing the water, and drying and compacting the web to the desired density. C.J.W.

ADHESIVES

HUMPHNER, FERDINAND W. Remoistening adhesive composition. U. S. patent 2,468,443. Filed Aug. 14, 1948. Issued April 26, 1949. 3 claims. Assigned to Mid-States Gummed Paper Co.

An adhesive suitable for a gummed tape contains starch acetate and bone glue in water; methylcellulose or the boric acid ester of glucose can be added. C.J.W.

NOAKES, HENRY F., and MARTYN, JAMES R. Adhesive and method of making same. Canadian patent 456,873. Filed Sept. 15, 1941. Issued May 24, 1949. 4 claims. Assigned to Canadian Industries Limited.

A process for joining a plurality of paper sheets, at least one layer of which has a grease or wax coating on the surface to be joined, consists in applying thereto a nonacid emulsion containing from 40 to 80 parts of a water solution of a protein glue and from 60 to 20 parts of water-immiscible solvent for the oil or grease and then applying a second sheet of paper in contact with the emulsion. The solvent may be carbon tetrachloride and the protein glue may be partially hydrolyzed. C.J.W.

ASPLUND PROCESS

ASPLUND, ARNE J. A. Method for manufacture of pulp. Canadian patent 456,639. Filed Jan. 22, 1948. Issued May 17, 1949. 2 claims.

This is a continuation of Canadian patent 449,189 (June 22, 1948); *cf.* B.I.P.C. 18:801. Lignocellulosic materials are subjected to a pretreatment with an alkali under atmospheric conditions, the excess alkali is removed by pressing, and the treated material is defibrated in the usual manner. C.J.W.

BOARD SPECIALTIES

HORNING, RAYMOND H., and WILCOX, ISAAC L. Container construction. U. S. patent 2,470,984. Filed Sept. 7, 1944. Issued May 24, 1949. 10 claims. Assigned to Oswego Falls Corporation.

The patent covers the closure of a rectangular container for liquid products. The closure consists of a central flat portion formed about its periphery with an inverted channel having inner and outer side walls; the channel is formed to receive the top edge of the container body. At least the inner surface of the container body and the under side of the top closure are coated with an impervious heat-sealing material, such as the copolymer of vinyl chloride and vinyl acetate. A part of the top is not permanently sealed to the container but can be moved to provide an opening for the removal of the contents. C.J.W.

RINGLER, WILLIAM A. Partitioned cover and method of making it. Canadian patent 457,068. Filed Feb. 19, 1948. Issued May 31, 1949. 7 claims. Assigned to The Gardner-Richardson Company.

A method is described for forming one-piece knockdown carriers having partition elements. C.J.W.

CELLULOSE—OXYCELLULOSE

WAGNER, CARY R., and AXE, WILLIAM N. Drilling fluids and methods of using same. U. S. patent 2,468,792. Filed Aug. 18, 1947. Issued May 3, 1949. 12 claims. Assigned to Phillips Petroleum Company.

A water-base drilling mud contains from 0.5 to 10 pounds per barrel of a salt of oxycellulose (prepared with nitrogen dioxide). The sodium, potassium, lithium, ammonium, magnesium, calcium, or strontium salt can be used. The oxycellulose contains between 5 and 25% carboxyl. Various examples illustrate the effect of such salts on the viscosity, gel strength, and water loss of such muds. C.J.W.

CHLORINE DIOXIDE

HOLST, TORSTEN G. Process for producing chlorine dioxide. U. S. Reissue patent 23,111. Filed July 23, 1947. Issued May 10, 1949. 14 claims. Assigned to Mo och Domsjö Aktiebolag.

This is a reissue of U. S. patent 2,373,830 (April 17, 1945). Sodium chlorate is reacted with sulfur dioxide. C.J.W.

DIELECTRICS

MALLETT, MONTVILLE B. Fibrous electrical insulating cylinder. Canadian patent 456,900. Filed June 18, 1946. Issued May 24, 1949. 17 claims. Assigned to English Electric Company of Canada.

A process of manufacturing fibrous electrical insulating cylinders consists in arranging wet fibrous cellulose stock in sheet form free from active bonding agent on a mandrel in superimposed layers to form a cylinder, winding a rope circumferentially about the cylinder, progressively and repetitively applying pressure to the whole cylinder through the rope to compact the cellulose fibers, and finally removing substantially all the remaining water. C.J.W.

DISPENSING CONTAINERS

BALL, CHARLES O. Dispensing container having closure locking means. U. S. patent 2,470,388. Filed Jan. 25, 1945. Issued May 17, 1949. 3 claims. Assigned to Owens-Illinois Glass Company.

The container consists of a body and a plural-ply top of sheet material, the top including an integral hinged portion serving as a means for opening and closing a filling and dispensing opening in the top of the container. C.J.W.

WILCOX, ISAAC L. Container. U. S. patent 2,471,017. Filed Dec. 4, 1946. Issued May 24, 1949. 4 claims. Assigned to Oswego Falls Corporation.

The major portion of the end closure of the container is permanently and fixedly sealed to the body and the remainder can be moved to provide a pouring opening for the removal of the contents. C.J.W.

FOLDING BOXES

BARTER, BERT H. Folded box. U. S. patent 2,468,951. Filed Sept. 1, 1945. Issued May 3, 1949. 1 claim. Assigned to Great Southern Box Company, Inc.

A box of unusual sturdiness derives its strength from the fact that it is of double thickness at the corners, with sides and ends folded double along lines that define the top edges of the box to form inner and outer side and end panels. The outer side-panel portions have lateral flaps extending between the folds of the ends and the inner end-panel portions have lateral flaps that extend between the folds of the sides, the side flaps being firmly interlocked in immovable position by the panel portions that enclose them and, in turn, support the sides and ends of the box in rigid upright position. C.J.W.

CHALMERS, JOHN W. Box. U. S. patent 2,468,543. Filed Dec. 19, 1945. Issued April 26, 1949. 2 claims. Assigned to Molins Machine Company, Limited.

The back of the box is provided with two slits which commence at opposite ends of the hinge and extend toward the bottom of the box; when the lid of the box is forced back, the part of the box between the slits bends and when the lid is released the part springs back towards its original position. This prevents tearing of the box at or near the hinge. C.J.W.

CONWAY, JAMES F. Folding box. U. S. patent 2,469,497. Filed Aug. 25, 1945. Issued May 10, 1949. 1 claim. Assigned to National Folding Box Company, Incorporated.

The patent covers a carton for radio tubes, light bulbs, and similar articles. C.J.W.

LEWIS, ALBERT M., and WEILER, PETER B. Collapsible box. U. S.

patent 2,470,174. Filed Dec. 22, 1947. Issued May 17, 1949. 5 claims.

The patent covers a collapsible box having a frame to which the oppositely disposed side walls are pivotally connected at their upper edges and which serves as an abutment for the end walls when swung into operative position and which also serves to retain the form in rigid position when in collapsed form and when in operative position. The cover is so arranged that it may be partly or fully opened; when in the closed position, a downward collapsing of the cover into the box is impossible. C.J.W.

GAGNON, JAMES. Folding berry box. U. S. patent 2,471,147. Filed Sept. 8, 1947. Issued May 24, 1949. 2 claims.

The construction is described of a folding berry box in which the bottom is at substantially the same level as the lower margins of the sides of the box, thus avoiding a so-called false bottom. C.J.W.

SHINA, FRANK C. Folding carton. U. S. patent 2,468,123. Filed Sept. 18, 1946. Issued April 26, 1949. 2 claims. Assigned to United Board & Carton Corporation.

The invention covers a simple end closure which gives rigidity to the container and which may or may not be used with an adhesive. It is designed for a hexagonal carton. C.J.W.

SIEWERT, EDWIN C. Spoon package. U. S. patent 2,469,343. Filed March 7, 1946. Issued May 3, 1949. 1 claim. Assigned to Marathon Corporation.

A means for retaining a spoon within a package of ice cream and the like is described. C.J.W.

SROFE, JESSE. Folding box. U. S. patent 2,470,270. Filed Aug. 29, 1946. Issued May 17, 1949. 2 claims. Assigned to The Globe-Wernicke Company.

This patent refers to a folding box of telescopic construction for use as a receptacle for letters and the like. The outer case is provided with a window arrangement which permits examination of the papers from the top and end while the box is closed. C.J.W.

WILLIAMSON, MARSHALL I. Container. U. S. patent 2,469,535. Filed Oct. 26, 1944. Issued May 10, 1949. 4 claims. Assigned to National Folding Box Company, Incorporated.

The construction of a siftproof container is described. C.J.W.

INSULATION AND INSULATING MATERIALS

PORTZ, FREDERICK G. Disintegrated newsprint-boric acid insulation composition. U. S. patent 2,470,641. Filed May 12, 1945. Issued May 17, 1949. 2 claims.

An insulation composition consists of approximately 25 pounds of dry powdered boric acid mixed with 75 pounds of dry disintegrated newsprint. The mixture is comparatively fire resistant. C.J.W.

MACHINERY—BOARD MACHINES

BREYFOGLE, ROY H. Primary suction drum assembly. Canadian patent 456,689. Filed Nov. 21, 1947. Issued May 17, 1949. 5 claims. Assigned to Alton Box Board Company.

A cylinder-type papermaking machine has a pickup felt, a turning roll for the felt spaced longitudinally from the end of the forming section and co-acting with the section to provide an extended run of the felt, and a suction press receiving the felt to dewater the web before the web is subjected to a change in the direction of travel. C.J.W.

MACHINERY—CHIPPERS

PAYZER, STANLEY D. Apparatus for handling chipper knives. U. S. patents 2,470,261 and 2,470,262. Filed Oct. 9, 1944. Issued May 17, 1949. 3 and 1 claims. Assigned to D. J. Murray Manufacturing Co.

An apparatus is described for inserting and removing chipper knives. This is carried out without complete removal of the normal knife retaining elements of the rotor assemblage. C.J.W.

MACHINERY—CONSISTENCY REGULATORS

KÄLLE, KARL T. Apparatus for the automatic indication and regulation of the viscosity or concentration in liquid. Canadian patent 456,497. Filed Nov. 28, 1946. Issued May 10, 1949. 2 claims.

An apparatus for automatically indicating the viscosity or concentration of liquids, more particularly fiber suspensions, consists of a rotating member having a spindle immersed in the liquid, a turbine wheel mounted around the spindle, a pipe supplying a liquid jet having a constant force to the turbine wheel, a vessel containing liquid and fixed around the spindle below the turbine wheel, and means responsive to fluctuations in the liquid level in the vessel, caused by variations in the rotation speed, the variations being dependent on the concentration of the liquid to be regulated. C.J.W.

MACHINERY—CONVERTING MACHINERY

GOSS, HAROLD J. Method of and machine for making unitary setup covered boxes. U. S. patent 2,469,641. Filed Jan. 4, 1947. Issued May 10, 1949. 16 claims. Assigned to Central National Bank of Cleveland.

A machine is described for forming a unitary box having a body provided with end walls of double thickness embracing and adhesively secured to and concealing tabs projecting from the ends of the rear wall of the body, thereby providing a box of greater rigidity. C.J.W.

LEE, HARRY E. Method of and apparatus for superimposing and severing webs. Canadian patent 457,132. Filed June 26, 1947. Issued May 31, 1949. 8 claims. Assigned to St. Regis Paper Company.

This is the same as U. S. patent 2,307,142 (Jan. 5, 1943) and relates to an apparatus for perforating webs. C.J.W.

PETERS, JOHN F. Can body making machine. U. S. patent 2,468,777. Filed Dec. 8, 1943. Issued May 3, 1949. 7 claims. Assigned to American Can Company.

In the formation of tubular fiber containers, provision is made for preheating edge portions of the partially formed container body and for applying adhesive thereto preparatory to joining the edge portions in a side seam. C.J.W.

MACHINERY—CUTTERS

MOORE, LAWRENCE A. Sheet cutting and delivery means. Canadian patent 457,108. Filed June 4, 1945. Issued May 31, 1949. 41 claims. Assigned to American Coating Mills, Inc.

This is the same as U. S. patent 2,427,223 (Sept. 9, 1947); *cf.* B.I.P.C. 18: 134. C.J.W.

MACHINERY—DOCTORS

HORNBOSTEL, LLOYD. Doctor blade mounting. U. S. patent 2,470,400. Filed April 27, 1945. Issued May 17, 1949. 5 claims. Assigned to Beloit Iron Works.

This corresponds to Canadian patent 447,537 (March 30, 1948); *cf.* B.I.P.C. 18: 643. C.J.W.

MACHINERY—FELTS

LEE, RAYMOND J. Papermaker's felt. Canadian patent 456,661. Filed Jan. 21, 1948. Issued May 17, 1949. 8 claims.

The warp yarn consists of wool fibers and the filler yarns consist of a blend of approximately 30% ramie and 70% wool fibers; the felt has a nap including both wool and ramie fibers. C.J.W.

MACHINERY—MIXING APPARATUS

ROSMAIT, JOHN A. Paper pulp agitator. U. S. patent 2,470,267. Filed March 10, 1945. Issued May 17, 1949. 1 claim. Assigned to D. J. Murray Manufacturing Co.

The construction of a pulp-storage and agitating chest is described, in which the undesirable deposition and accumulation of fibers are eliminated and in which the most effective agitation is produced by proper formation of the chest walls and surfaces which bound the storage space. C.J.W.

MACHINERY—PAPER MACHINE—YANKEE TYPE

GOODWILLIE, JOHN E. Paper machine. Canadian patent 456,855. Filed March 9, 1946. Issued May 24, 1949. 8 claims. Assigned to Beloit Iron Works.

The machine includes the combination with a pickup felt and a drier felt of a suction transfer roll having a suction area against which the drier felt is lapped and a second roll spaced and offset from the transfer roll for guiding an unsupported portion of the pickup felt against the lapped portion of the drier felt so that, when the pickup felt is carrying a wet fibrous web, the web may be transferred to the drier felt without becoming embedded therein. C.J.W.

MACHINERY—PASTING MACHINE

BROWN, WILLIAM A. Paste-applying mechanism. U. S. patent 2,469,030. Filed Jan. 5, 1945. Issued May 3, 1949. 10 claims. Assigned to Hartford-Empire Company.

An apparatus is described for applying paste or other adhesive to labels which are to be applied to cans, bottles, and similar containers. C.J.W.

COOK, THOMAS L. Machine for applying labels to containers. U. S. patent 2,468,922. Filed Dec. 12, 1944. Issued May 3, 1949. 15 claims.

An apparatus is described for applying adhesive to a container so that the adhesive will cover substantially the same area that receives the label. C.J.W.

MACHINERY—WAXING MACHINE

CROWDER, HAVY Q. R., and BRONSON, EDWARD A. Apparatus for applying wax to thin sheets. U. S. patent 2,470,093. Filed Aug. 6, 1945. Issued May 17, 1949. 2 claims.

An apparatus is described for applying a coating of wax to a very thin sheet of cellulose acetate; the product is useful for producing backgrounds, shadings, and the like on drawings, maps, etc. to be later reproduced by a photographic process. C.J.W.

MATERIALS HANDLING

MOORE, BERTRAM A. Equipment for handling pulpwood and the like. Canadian patent 457,006. Filed June 2, 1947. Issued May 31, 1949. 4 claims.

The patent covers movable land scows which form receptacles for holding and measuring a quantity of wood lengths, means for forming the measured quantity of wood into a cylindrical bundle, and means for tieing the formed bundles having link means for engaging bundle-lifting means. C.J.W.

MOLDED PULP ARTICLES

CHAPLIN, MERLE P. Molded pulp apparatus and method. U. S. patent 2,471,932. Filed Dec. 23, 1941. Issued May 31, 1949. 24 claims.

An apparatus is described for molding such articles as milk bottle caps. Means are provided for applying heat to the molded article after formation for removal of the moisture. C.J.W.

PAPER—COATED

BEYNON, NATHAN T. Wrinkle flexible material with rubber solution coating. U. S. patent 2,468,724. Filed March 21, 1946. Issued May 3, 1949. 8 claims. Assigned to New Wrinkle, Inc.

The coating agent is a mixture of 100 parts of unsaturated fatty oil with varnish solvent and a solution of 40 parts of a synthetic rubber (Neoprene, butadiene-styrene copolymer, or butadiene-acrylonitrile copolymer). The coated paper or the like is dried 30 minutes at 130° F. and 30 to 60 minutes at 180° F. A list of suitable solvents is given. C.J.W.

FRIES, KARL W. Wax-polyamide-pinene resin coating composition. U. S. patent 2,469,108. Filed Aug. 6, 1945. Issued May 3, 1949. 3 claims. Assigned to Rhinelander Paper Company.

A lacquer composition adapted for use as a moistureproofing coating composition consists of from 1 to 10% of polymerized beta-pinene resin (melting about 115° C.), from 1 to 10% of a paraffin wax, and (as the remainder) a plasticized polyamide resin (Norelac) in an organic solvent (the mixture contains 25 to 30% solids). A polyisobutene resin (Vistanex) can be used in place of the polyamide resin. The composition can be applied to glassine and other greaseproof papers, kraft, sulfite, and various cellulosic films. A paper coated with plasticized polyamide resin compounded with 3.75% wax and 1.25% Vistanex had a moisture vapor transmission rate of 1.5 g./100 sq. in./24 hrs.; with 7.5% wax and 2.5% Vistanex, the value was 0.7 g. C.J.W.

KNIGHT, GEORGE D., and ROWLAND, BEN W. Method of continuously coating porous sheets. U. S. patent 2,471,330. Filed Feb. 17, 1947. Issued May 24, 1949. 4 claims. Assigned to The Institute of Paper Chemistry.

A method of continuously coating a porous sheet consists in evacuating the fluid ingredients from a region adjoining and within a surface of a sheet, removing the evacuated region from the zone of evacuation to a coating zone, and promptly thereafter applying fluent coating material to the removed region under at least atmospheric pressure before direct exposure to the ambient atmosphere, leveling the applied coating to provide a coating of predetermined thickness, and moving the sheet relative to the evacuation, coating, and leveling zones to enlarge the coated areas. One or both sides of the sheet can be coated. C.J.W.

LATHAM, HENRY H., and MORTON, JOSEPH R. Process of rendering anionic coating materials adherent to anionic bases. U. S. patent 2,468,086. Filed June 21, 1948. Issued April 26, 1949. 12 claims. Assigned to Morton Chemical Company.

In the coating of paper and like materials with natural and synthetic rubbers, natural resins, and the like, improved results are obtained if the base material is coated or impregnated with a cationic active agent prepared by reacting a member of the group consisting of alkyl sulfates, phosphates, or halides with an organic unsaturated compound made by condensing an alkylene polyamine with an acid, including the acids derived from tall oil. The final product is a dehydrated aliphatic, alkylated, alkylene polyamide. Various examples are given of such preparations. C.J.W.

PAPER SPECIALTIES

BAKER, ARTHUR W. Waterproof explosive cartridge. U. S. reissue patent 23,102. Filed Aug. 21, 1947. Issued April 26, 1949. 5 claims. Assigned to Hercules Powder Company.

This is a reissue of U. S. patent 2,408,189 (Sept. 24, 1946) and relates to a cartridge formed of laminated asphalt paper. C.J.W.

COOK, HERBERT G. Wrapper for packages. Canadian patent 456,867. Filed Aug. 10, 1946. Issued May 24, 1949. 5 claims. Assigned to Canadian Foils Limited.

A wrapping sheet has portions adapted on folding to contact other portions which are coated with a heat-sealable material (e.g., a water-phase emulsion of vinyl acetate or vinyl chloride) applied to the surface in a finely separated pattern with spaces intervening to permit lateral spread of the adhesive on application of heat. C.J.W.

HERMANSON, WILLIAM A. Sanitary pad. U. S. patent 2,468,876. Filed April 30, 1945. Issued May 3, 1949. 6 claims.

The enclosing paper-web wrapper is permeable to moisture, has wet strength and substantially no capillary action; it is formed of a duplex web, the exposed faces of which are composed of fibers having no heat-sealing properties; the inner faces are formed with fibers having heat-sealing properties whereby the wrapper is bonded to the wadding. C.J.W.

HOWARD, FRED. Production of paper and other materials. Canadian patent 456,953. Filed Nov. 12, 1946. Issued May 24, 1949. 20 claims. Assigned to Sutcliffe, Speakman & Company Limited.

A finely divided activated carbon is incorporated into the paper; the carbon may be impregnated with a material chosen from the group consisting of formaldehyde and a solution of a copper salt. The paper employed may be of the wet-strength type. An outer sheet of impervious material can be applied to the impregnated sheets. C.J.W.

KARFIOL, EDWARD, and ROEHM, WILLIAM A. Method of making shelf edging. U. S. patent 2,470,493. Filed Nov. 25, 1944. Issued May 17, 1949. 4 claims. Assigned to Virtu, Inc.

A printed design is covered, in whole or in part, with a preformed transparent plastic appliqué. The method of application is described. C.J.W.

MILLER, KAY. Pencil with body of convolutely wound paper. U. S. patent 2,469,049. Filed March 11, 1947. Issued May 3, 1949. 2 claims. Assigned to Joseph Dixon Crucible Company.

The core of marking material is wound with a sheet of paper which has been impregnated with a lubricant (paraffin, oils, greases, or waxes); the fibers are disposed substantially parallel to the core axis and the successive convolutions are adhered by a suitable adhesive (sodium silicate). C.J.W.

MYERS, JAMES E. Multiple pocket envelope. Canadian patent 456,569. Filed June 19, 1947. Issued May 10, 1949. 5 claims. Assigned to Globe Envelopes Limited.

A four-compartment envelope, closed at two opposite sides, has a flap at each of the other two opposite sides and means for joining the front and back of the envelope along two crossing lines to divide the envelope into four pockets. C.J.W.

NORDEN, JESSE. One-piece paper container. U. S. patent 2,468,306. Filed Dec. 18, 1946. Issued April 26, 1949. 4 claims.

The construction of paper containers (especially milk bottles) is described; they are formed from a blank of paper having pleats forming a multi-ply bottom from the central portion of the blank and multi-ply walls formed from portions extending radially of the central portion, the

free edges of the blank terminating substantially in a common plane at the open end of the container; the plies of the bottom and side walls are sealed together. C.J.W.

PALMER, FRANK D. Siftproof bag. U. S. patent 2,470,789. Filed Nov. 26, 1945. Issued May 24, 1949. 2 claims. Assigned to Frank D. Palmer, Inc.

The inner receptacle has a closure embodying an ear having separable plies of material extending from a pair of walls of the receptacle and united around the free edges of the ear and the outer receptacle has a closure embodying a plurality of flaps successively folded over and adhesively secured to one another to form an end wall for the package. Provision is made for a tubular dispensing spout communicating with the interior of the package. C.J.W.

RUSSO, GIUSEPPE. Match book. U. S. patent 2,470,523. Filed Nov. 15, 1944. Issued May 17, 1949. 2 claims.

The manufacture of a match book is described, in which match splints are formed of the same material as and integrally with the cover. C.J.W.

TERRY, THOMAS A. Multisection envelope and blank for forming the same. U. S. patent 2,469,853. Filed April 10, 1945. Issued May 10, 1949. 1 claim. Assigned to C. & M. Envelope Company.

The invention covers an envelope having a plurality of separate partitioned sections on the interior and a common sealing flap, all formed from a single foldable blank. C.J.W.

VIVIAN, GEORGE S. Carton and secondary closure therefor. U. S. patent 2,470,199. Filed Sept. 7, 1945. Issued May 17, 1949. 2 claims.

The patent covers a top closure for milk cartons and the like which will provide means for opening and closing the container. The invention provides a means for opening the seam to permit pouring liquid from the container; it is also possible to drink directly from the container. C.J.W.

WHITE, EDWARD R. Envelope. U. S. patent 2,469,251. Filed Dec. 21, 1945. Issued May 3, 1949. 9 claims.

A paper bag is provided with a sheath at the flap end which has an entrance slot and a tongue which bridges the open end of the bag. The tongue may be made in two parts, one for detachably closing the open end of the bag and the other for sealing it. The tongue may be placed off center to the slot in the sheath to provide a friction hold. C.J.W.

WINESETT, FRANKLIN P. Method of making shopping bags. U. S. patent 2,469,536. Filed March 4, 1946. Issued May 10, 1949. 4 claims. Assigned to Crown Zellerbach Corporation.

The invention covers a shopping bag with a folded top and with handles having their ends secured to and covered by the bag. The construction is described. C.J.W.

PHYSICAL TESTING—PAPER—WET STRENGTH

SOBOTA, JOHN. Method of evaluating paper toweling or the like. U. S. patent 2,469,013. Filed Jan. 19, 1948. Issued May 3, 1949. 2 claims. Assigned to Fort Howard Paper Company.

The toweling is placed within a circular frame, moistened, and loaded with weights until the toweling breaks. This is regarded as a measure of the wet strength. C.J.W.

PLASTICS—PAPER-BASE

RYAN, PATRICK P. Resinous laminates and production thereof. Canadian patent 457,131. Filed Jan. 23, 1947. Issued May 31, 1949. 8 claims. Assigned to St. Regis Paper Company.

This covers the same type of resinous laminate as that covered by U. S. patent 2,415,763 (Feb. 11, 1947); *cf.* B.I.P.C. 17: 396-7. C.J.W.

SHIPPING CONTAINERS

TAYLOR, WILLIAM H. Fiberboard container for disk-shaped articles. U. S. patent 2,471,173. Filed July 27, 1945. Issued May 24, 1949. 2 claims. Assigned to Sears, Roebuck and Co.

A container has been designed for the packaging of such articles as circular saws. The principal panel of the package is octagonal in outline with each of its eight sides preferably having equal length. C.J.W.

SHIPPING CONTAINERS—MULTIWALL BAGS

BURROUGHS, EDWIN E. Mechanism and method for forming sleeved valve bags. Canadian patent 456,789. Filed April 8, 1947. Issued May 17, 1949. 17 claims. Assigned to St. Regis Paper Company.

A method is described for forming valves in flattened gusseted paper bag tubes and introducing supplemental sheets to form valve sleeves therein. C.J.W.

GEIMER, WILLIAM J., and LINDA, FRANK R. Method of closing bag tube ends. Canadian patent 457,027. Filed July 11, 1945. Issued May 31, 1949. 3 claims. Assigned to Bemis Bro. Bag Co.

A method is described for closing a valve-type bag with tape. C.J.W.

STARCH

KERR, RALPH W. Treatment of starch. U. S. patent 2,468,207. Filed July 18, 1945. Issued April 26, 1949. 7 claims. Assigned to Corn Products Refining Company.

A starch size, which is colloidally stable in the presence of an alkaline agent, is readily dispersible in water, and has a very high paste viscosity, is prepared by gelatinization in the presence of from 0.5 to 10% of sodium stannate. The potassium salt or a mixture of the two can be used. C.J.W.

SULFITE WASTE LIQUOR

BOOTH, ROBERT B., and PICKENS, ROY A. Froth flotation of sulfide ores. U. S. patent 2,471,384. Filed May 16, 1946. Issued May 24, 1949. 3 claims. Assigned to American Cyanamid Company.

In the beneficiation by froth flotation of a metallic sulfide mineral by means of a promoter selected from the group consisting of the xanthate, dithiophosphoric acids, and dithiophosphate types, an improvement consists

in carrying out the separation in the presence of 0.01-0.5 lb./ton of a surface-modifying agent for the mineral; this is a salt of a lignosulfonate. The neutral and basic calcium, acid magnesium, neutral ammonium, and neutral sodium salts are mentioned. C.J.W.

DUNBAR, THOMAS L. Method of treating waste sulfite liquor. U. S. patent 2,470,764. Filed Sept. 23, 1943. Issued May 24, 1949. 10 claims.

The waste liquor is treated with an oxidizing agent, such as bleach liquor or hydrogen peroxide, the quantity depending on the amount of ligneous matter present (generally from 6 to 10%); the filtrate is then treated with sodium chloride to precipitate sodium lignosulfonate. The second filtrate can be mixed with fresh bisulfite liquor and used for pulping. C.J.W.

TALL OIL

DAWSON, REGINALD D. Non-aqueous drilling fluid. Canadian patent 456,605. Filed May 1, 1944. Issued May 10, 1949. 11 claims. Assigned to Shell Development Company.

A nonaqeous drilling fluid contains a mineral oil, an asphaltic material, tall oil, and a base, together with a finely divided solid material adapted to increase the specific gravity of the fluid suspended therein. C.J.W.

DE VANEY, FRED D. Froth flotation of oxide iron ore. U. S. patent 2,470,150. Filed Jan. 2, 1946. Issued May 17, 1949. 5 claims. Assigned to Erie Mining Company.

Deslimed and acid-washed iron ore is thickened to 65-80% solids contents, adjusted to a pH of 8-8.5, treated with a sodium resinate or tall oil soap, and then subjected to froth flotation in the conventional manner. C.J.W.

DYKE, MILTON, and SELF, EDWARD S. Treatment of drilling fluids. U. S. patent 2,468,657. Filed April 29, 1946. Issued April 26, 1949. 4 claims. Assigned to Oil Well Chemical and Materials Company, Inc.

A water-clay-base drilling fluid contains from 1 to 10% (by volume based on the drilling fluid) of an alkali metal tall oil soap. C.J.W.

DYKE, MILTON, and SELF, EDWARD S. Treatment of drilling fluids. U. S. patent 2,468,658. Filed July 21, 1947. Issued April 26, 1949. 10 claims.

A water-base drilling fluid consists of clay and from 1 to 6% of tall oil soap. About 5% of petroleum oil is added to inhibit foaming. C.J.W.

TEXTILE INDUSTRY AND FABRICS—FIREPROOFING

MCLEAN, ANDREW, and MARRIAN, STANLEY F. Process for flameproofing combustible cellulosic material and product resulting therefrom. U. S. patent 2,470,042. Filed Nov. 21, 1946. Issued May 10, 1949. 12 claims. Assigned to Imperial Chemical Industries Limited.

The material is impregnated with polyethyleneimine and then treated with the reaction product of dipentaerythritol, orthophosphoric acid, and phos-

phorus pentoxide (dipentaerythritol hexaorthophosphate) or with triethoxymethylmelamine; the two reagents can be applied in succession. C.J.W.

TEXTILE INDUSTRY AND FABRICS—ROTPROOFING

COOK, ELMER W., and MOSS, PHILIP H. Mildew-proofing. U. S. patent 2,471,261. Filed May 9, 1946. Issued May 24, 1949. 4 claims. Assigned to American Cyanamid Company.

The mildewproofing agent is a heavy metal salt of a halogenated polyphenol sulfide containing from 3 to 10 phenol radicals. The copper and zinc salts of tris(*p*-chlorophenylol) sulfide and the copper salt of the corresponding disulfide are claimed. The preparation of the compounds is described. C.J.W.

HORSEY, ROBERT E. Mildewproofing composition containing copper naphthenate and bis-(5-chloro-2-hydroxyphenyl)methane. U. S. patent 2,468,068. Filed April 26, 1945. Issued April 26, 1949. 10 claims. Assigned to The Givaudan Corporation.

A mildewproofing composition consists of 1 to 10 parts by weight of bis-(5-chloro-2-hydroxyphenyl)methane and about 1 part by weight of copper in the form of copper naphthenate dissolved in 10 parts of isopropyl alcohol and 90 parts of naphtha. C.J.W.

TRANSPARENT CONTAINERS

WALLACE, GEORGE W., and TREW, JAMES W. Method of making unit dispensing packages. U. S. patent 2,468,695. Filed Aug. 1, 1945. Issued April 26, 1949. 2 claims.

A method is described for packaging relatively small units such as apples for display in which the container or envelope is built around the content; the container includes in its structure a hand grasp for convenience in handling. C.J.W.

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